



Ohio Mushroom Society
The Mushroom Log

Winter Musings

By Dave Miller

The other day (Dec. 1, 2010) a two man crew from Oberlin's Light & Power came by to saw off the upper part of a Norway maple tree, which was threatening a nearby power line. I set about cutting it up to feed our voracious fireplace insert, and discovered that this dead tree supported an interesting collection of fungi. In one split in the bark some shriveled black jelly fungus. Upon thawing and rehydrating it, it appeared to be, actually some very old, decaying Tremella sp.

Further down the trunk was a nice cluster of the tree ear fungus (*Auricularia auricula*). Though both of these appeared relatively fresh, while sawing the tree up, it was snowing lightly and the temperature was hovering in the mid-20's, with a wind chill well below that, which the combination of cold and numbness in my fingertips made evident.

While I was out there sawing away, I noticed an old stump of a box elder, with several clusters of oyster mushrooms, *Pleurotus ostreatus*, emerging from it. Had the stump not been so large and heavy I might have reduced it to firewood,

several seasons earlier. Now it had rewarded my neglect with something good to eat.



Oysters with snow (above) and without (below)



By the way, it had been quite warm (upper 50's) and rainy about four days prior to my discovery of these fungi. I've found oysters previously in mid-January, encased in a block of ice. So there are good edibles out there, you just need to keep track of the weather and take advantage of the periodical thaws which usually happen during the winter season. (though right now [late Jan., '11] we've gone into a deep freeze which NOAA promises to persist for a while yet).

Speaking of the great outdoors, Jane Brody, a NY Times writer on Health issues had an article in the Tuesday, November 30, 2010 Science section entitled "Head Out for a Daily Dose of Green Space," in which she describes a newly identified syndrome labeled "Outdoor Deprivation Disorder", which the doctors describe as a condition arising from a lack of outdoor activity.

But when the Rx involves increasing outdoor activity, now that's something I think we can all get on board for!

And make no mistake about it, health officials are taking this seriously. To quote the article: "The ...lack of physical activity and a growing disconnect with the natural environment have been linked in a host of studies to obesity and obesity-related diseases in children and adults., including Type 2 diabetes, high blood pressure, heart disease, asthma and nonalcoholic fatty liver disease, as well as vitamin D deficiency, osteoporosis, stress, depression, attention deficit disorder and myopia. Dr. Daphne Miller, a family physician affiliated with the Univ. of Cal., San Francisco, calls them 'diseases of indoor living.'"

To help deal with this, "...Dr. Miller and a growing number of like-minded doctors have begun

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writing specific prescriptions for outdoor activity, providing patients with maps, guidelines and programs of gradually increased activity based on their abilities. She said such prescriptions are necessary because many people 'are unfamiliar with the outdoors—they're scared to walk through a park, and they don't know what to do when they get there.'"

Knowing what to do wouldn't be a problem for any of us. We'd start looking for fungi. In fact, I am probably preaching to the choir here anyway, so I won't belabor the point.

Contrast this type of medical intervention with the reliance on prescription drugs. Clearly, there are medical conditions in which drugs play an important, even life-saving role. But there is a current trend toward shifting the limits of what was once considered normal to what is now viewed as pathological. As an example, blood pressures which were once considered near the upper limit of normal now belong in a newly created condition: "prehypertension."

Might the drug companies have a hand in these changes?

Life-style changes (lowering salt or caloric intake, exercise, etc.) are less frequently recommended, perhaps because many people would rather take a pill than change their familiar habits.

So watch the prescription drugs and get out there to look for 'shrooms! Even if your basket is empty at the end of the day, you'll have gotten your daily dose of sun and fresh air!

Paul Stamets Talks Mycorestoration

By Igor Malcevski

Note from Dave Miller, your editor: I am reprinting this article from the Winter, 2006 Mushroomer, a publication of the Snohomish Co. [WA] Mycol. Soc. In a way, this is in lieu of a book review of Mycelium Running, How Mushrooms Can Help Save the World, which I promised to do in a moment of weakness at an OMS Board meeting one cold February day. If this whets your appetite to learn more, the book was published in 2005 by Ten Speed Press. It's a 339 page paperback, ISBN # 1580085792. It's been out long enough that Amazon.com can give you a pretty deal on it.

Igor Malcevski, editor of the SCMS, notes: "Information gathered for this article is from Paul Stamets' presentation to the PSMS and from his website <http://www.fungi.org>.

At the Nov. PSMS meeting Paul Stamets discussed how mushrooms can rescue the planet. Much of the material that he discussed was from his latest book: **Mycelium Running**. He calls this process mycorestoration and the four components of it are:

- Mycofiltration: the filtration of biological and chemical pathogens as well as controlling erosion.

- Mycoforestry and mycogardening: the use of mycelium for companion cultivation for the benefit and protection of plants.

- Mycoremediation: the use of mycelium for decomposing toxic wastes and pollutants.

- Mycopesticides: the use of mycelium for attracting and controlling insect populations.

Several examples of mycogardening were shared. One that proved to be a great success was the production of a choice edible, *Macrolepiota procera*, a non-native mushroom to our area. This mushroom is a relative of *Lepiota rachodes*, a native to the area. The mycelium of *Macrolepiota procera* was developed in Stamets' laboratory and inoculated near ant hills. The ants find this mycelium to be a good food source and thus cultivate and spread it throughout the garden. Last year Stamets had over 200 fruitings on his property. Another product being developed is soil for organic farmers. Wood chips/sawdust piles are inoculated with mycelium to produce edible mushrooms. After the fruiting has finished the mycelium is added to compost. The red worms in the compost eat the mycelium and in return produce the soil. The whole process takes about four months.

An example Stamets shared regarding mycoforestry was the use of oils saturated with spores. He developed biodegradable chain saw oils containing mushrooms spores. Stamets would like the lumber industry to use his chainsaw oil which could introduce spores to limbs and stumps and thus promote quicker decay of dead wood. The decayed wood can then be more quickly utilized by other forest organisms.

Stamets strongly feels mycoremediation is the wave of the future for many toxic clean-up projects.

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He talked about a project he did years ago with Batelle Labs regarding soil contaminations created by a Bellingham Transportation Dept. The project was to study four huge piles of soil contaminated with high dosage of hydrocarbons (gas and oil residues). One pile was the control pile, the second had enzymes introduced, the third bacteria and the fourth oyster mushroom mycelium. The piles were covered with tarps and six weeks later the results were revealed. The only pile that changed was that of the mycelium. They found a huge fruiting of oyster mushrooms. At this point they were concerned about edibility of these mushrooms since they were growing in toxic waste. They analyzed the mushrooms and found no hydrocarbons; the mycelium had reconstructed the hydrocarbons into edible carbohydrates. The soil was reduced from 20,000 part per million of hydrocarbons to 200 and approved for freeway landscaping use in 8 weeks.

Another case to support mycoremediation is more global. After the Chernobyl disaster, the Ukrainians did studies on mushrooms growing in the area to determine which were edible. They found that *Gomphidius glutinosus* hyper-accumulated cesium-137, more than 10,000 times. Why would the mushroom take in this huge amount of radioactive material? What the mushroom did was decontaminate the surrounding environment for other organisms to live safely. Paul feels the mycelium is an intelligent being and that it is trying to heal the ecosystem for future generation.

Ed. Note: Fungi do some amazing things, but this seems a bit of a

stretch. But who knows but what Paul might be right about this. As Einstein said: "If at first the idea is not absurd, then there is no hope for it."

Mycopesticides could be a safe defense against harmful pests. A while back Paul had problems with carpenter ants in his house. Part of his house constantly leaked and the moisture brought in mycelium and carpenter ants. He indicated that the mycelium makes the wood sweeter and softer and insects prefer to eat this kind of wood. He wanted to get rid of the carpenter ants using fungal pathogens that were not detrimental to bees. In his research he found that the EPA was interested in a group of metharizium cultures. Making some of these cultures Paul noticed that all of the cultures had sporulated but there were sections where there was an absence of spores. It was figured that the spored culture areas should be more active against the carpenter ants. Researchers inoculated the carpenter ants with this spored culture and sure enough they were infected and eventually died. When spore cultures were introduced to the carpenter ants' environment as bait stations the carpenter ants avoided them. They seemed to know that these spored cultures would harm them. Paul began working on the culture portions lacking any spores. He cultured the mycelium through six generations of plates and developed a culture that would produce delayed sporulation. He next put out these cultures in baited areas to see if the carpenter ants would be attracted to them. Sure enough the worker ants came and took the cultures into the nest. Later it was determined that the mycelium was totally friendly to

the guards and the queen in the nest, thus the mycelium tricked the carpenter ants into taking it into the nest and infecting the whole colony. Two weeks later Paul was free of carpenter ants.

There are more examples that he talked about that I did not mention in this article. A very interesting and informative talk enjoyed by the attendees. If you want to know more about the topic of mycoremediation, read the book: **Mycelium Running** and/or go to www.fungi.com for additional information.

As a side note, Paul wore a hat made from mushrooms. The same type of hat that our club member, Rosemarie Carrier purchased in Eastern Europe. He indicated that the hat was made from a polypore, *Fomes fomentarius*. After the polypore is boiled and pounded it is formed into a material commonly known as German felt. This polypore grows on birches and has been used by mankind for thousands of years as tinder carrier and for igniting fires. (Ed. Note: We know better, from the Athens Summer Foray!)

Helping Fish Get Rid of the Fungus "Ich"

Copper sulfate has emerged as an effective treatment for *Ichthyophthirius multifiliis*, also known as "Ich," a protozoan parasite that appears as white spots on infected fish, according to a U.S. Department of Agriculture (USDA) scientist.

Aquatic toxicologist David Straus with USDA's Agricultural Research Service (ARS) investigated copper sulfate as a method to control both Ich in

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catfish and a fungus—*Saprolegnia*--on catfish eggs. Straus works at the ARS Harry K. Dupree Stuttgart National Aquaculture Research Center in Stuttgart, Ark. ARS is the chief intramural scientific research agency of USDA, and this research supports the USDA priority of promoting international food security.

Ich is considered the most prevalent parasite worldwide in ornamental fish, baitfish and food fish, according to Straus. Ich is less common in U.S. aquaculture because of management techniques, but when it occurs, it can kill all the fish in a pond or raceway. It is calculated that Ich was directly responsible for \$1.2 million in losses to the catfish industry in 2003.

The freshwater fungus *Saprolegnia* is another major pathogen in fish culture, killing eggs and invading wounds and lesions on juvenile and adult fish.

Straus found copper sulfate is an effective treatment for Ich on fish and fungus on eggs. According to Straus, copper sulfate is the only practical treatment to control Ich in catfish ponds that average about 10 acres in area. It is easy to use, effective and inexpensive, and is safe for the user to handle.

Current approved treatments for fungus on eggs, such as formalin and hydrogen peroxide, are much more expensive. Also, both compounds are hazardous, and there are human safety concerns as well as required storage precautions.

Copper sulfate is not currently approved by the U.S. Food and Drug Administration for therapeutic use in aquaculture, but regulatory action has been deferred pending the outcome of Straus' ongoing research. The chemical is approved by the U.S. Environmental Protection Agency as an algicide and molluscicide. Fish farmers use copper sulfate to control cyanobacteria that cause off-flavor in fish, and to control snails that transmit parasitic flatworms to fish. 28 October 2010. Newswise.com.

Atlantic Sea Turtle Population Threatened by *Fusarium solani*

An international team of mycologists and ecologists studying Atlantic sea turtles at Cape Verde have discovered that the species is under threat from a fungal infection which targets eggs. The research, published in FEMS Microbiology Letters, reveals how the fungus *Fusarium solani* may have played a key role in the 30-year decline in turtle numbers.

"In the past 30 years we have witnessed an abrupt decline in the number of nesting beaches of sea turtles worldwide," said Drs. Javier Dieguez-Urbeondo and Adolfo Marco from Consejo Superior de Investigaciones Cientificas- CSIC Spain. "While many of the reasons for this are related to the human impact on the coastal environment it has been suspected that the decline is also due to pathogenic microorganisms."

Fusarium solani is a complex fungal strain which represents

over 45 phylogenetic and biological species. The fungus is distributed through soil and can cause serious plant diseases. The fungus is known to have infected at least 111 plant species spanning 87 genera and has also been shown to cause disease in other animals with immunodeficiency.

During embryonic development turtle eggs spend long periods covered by sand under conditions of high humidity and warm temperatures, which are known to favor the growth of soil-born fungi.

Dr. Dieguez- Urbeondo's team focused their study on the loggerhead sea turtle (*Caretta caretta*) population on Boavista Island, Cape Verde, off the West African coast. While Boavista Island represents one of the most important nesting regions for this species a high hatching failure rate is driving population numbers down.

The team sampled egg shells with early and severe symptoms of infection, as well as diseased embryos from sea turtle nests located in Ervatao, Joao Barrosa and Curral Velho beaches and discovered 25 isolates of *F. solani* associated with egg mass mortalities.

Although this fungal species has been previously described in association with different infections in animals, its relationship to hatching failure had not been investigated before this study.

The finding that strains of *F. solani* may act as a primary pathogen in loggerhead sea turtles represents an extremely high risk to the conservation of

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loggerhead sea turtles across the area.

However, the description of these particular fungal strains causing this infection may help in developing conservation programs based on artificial incubation and may aid the development of preventative methods in the field to reduce or totally erase the presence of *F. solani* in turtle nests.

"This work reveals that a strain of *F. solani* is responsible for the symptoms observed on turtle nesting beaches," concluded Dr. Dieguez-Uribeondo. "This shows that the infection represents a serious risk for the survival of this endangered species, while also showing immunologists and conservationists where to focus their research." 29 October 2010. Sciencedaily.com.

The *Saccharomyces cerevisiae* In the Bottle

Canadian scientists uncork a brave new winemaking world by adding genomics to the fermentation tank

By Susan Nerberg

I swirl the glass and stick my nose in it. Fruit. Sun. Taking a sip, I taste citrus, hay and rock. Right away I wonder if there might be another bottle. I dig into the buttery sablefish and dainty carrots that have just been brought in and drink another mouthful, letting the wine's clean finish linger. As if reading my mind, my host pours again. No, I'm not dining at a winery restaurant, and the man topping up my glass isn't a sommelier or even a waiter. And although I'm technically in a cellar, it's the basement of the

nondescript Land and Food Systems building at the University of British Columbia. Yes, all this wining and dining is in the service of science.

Hennie van Vuuren, my drinking buddy and the founding director of UBC's Wine Research Centre, works here to make the fickle art of winemaking more predictable and productive. While grape varietal and terroir [soil's influence on wine flavor] are the pin-ups of the wine world, van Vuuren's obsession is yeast, a lowly single celled fungus. And no wonder more than 200 strains are used to bring out different flavours in grapes. But to take winemaking into the 21st century, van Vuuren et al have come up with genetically engineered yeasts, putting Canada on the scientific wine map and giving vintners the potential to consistently churn out great wines - like the Didier Dagueneau Pur Sang sauvignon blanc we polish off in the centre's wood-panelled tasting room.

In conventional winemaking, yeast is first added to the grape juice (a.k.a. the must) to transform sugar into alcohol and flavour compounds. Then certain bacteria are thrown in to convert harsh malic acid into the gentler lactic acid, reducing acidity and headache-inducing allergens and improving flavour. Trouble is, these friendly microbes often under perform, leaving a sour note on the palate and causing headaches among some 30 percent of the wine-drinking public, van Vuuren and me included. (And to think that my friends have always blamed my hangovers on overindulgence.) "I adore wine," says van Vuuren as we stroll through the Wine Research Centre's temperature-

and humidity controlled Wine Library and Vinotheque, which has space for up to 30,000 bottles in its floor-to ceiling redwood racks. "But I react to the histamines in reds and some whites, so I had to do something. "

The vinophile prof set out to create a yeast that would magically transmute all, not just some, of the offending acid; in the process, he beat out other scientists who'd been scratching their heads for three decades trying to solve the same riddle. Van Vuuren's team took two genes from organisms already used in winemaking and added them to the DNA of a commercial yeast. The new, patented yeast ML01, the world's first genetically engineered yeast that's available for sale - ferments the must and converts the malic acid in one fell swoop, for a better-tasting, headache-free wine. At least in theory.

To take winemaking into the 21st century, UBC scientists have come up with ways to genetically enhance the process, putting Canada on the scientific wine map and giving vintners the potential to consistently churn out great bottles.

Arriving at Calona Vineyards in Kelowna, in B.C.'s Okanagan Valley, I expect something more, well, Falcon Crest. Instead, I enter a suburban looking office building, where the avuncular Howard Soon greets me. He hands me a hairnet, "Imagine if your co-workers could see you now!" he laughs -- and ushers me through the factory-like plant, past stainless steel fermentation tanks, oak barrels and grape presses and

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crushers, before we climb a vinyl-tiled staircase to his office.

While van Vuuren claims winemaking is 90 percent science and 10 percent art, Soon, who is the senior vintner for Calona's high-end Sandhill Wines brand and also sits on the Wine Research Centre's advisory board, contends it's more like 50-50. "It's tempting to winemakers to think that if they use, say, MLO1, it will produce a flavour that everyone will love, but that would move winemaking into something for technicians," he says. "The art is still in finding the true expression of the vineyard. And it's in the blending."

He underscores his point in the tasting lab, a room only slightly larger than a walk-in closet and bedecked with beakers and plastic whisky bottles containing wines from around the world "for comparison." The task at hand is to rate one pure malbec and two malbec blends to fine tune the concoction that ultimately goes in the bottle. Joined by Soon's two winemaker colleagues, we sniff, slurp and chew. We spit. Or not. By the time our teeth are stained purple, the verdict is in: the malbec is good enough to hold its own. "You see, we do a bit more cooking than van Vuuren," Soon says.

Soon tested MLO1 on a red wine, hoping it would convert all the malic acid, leaving only lactic acid for a smoother result. It didn't, so he blended the wine with a conventional red. "Here we don't have the same hypercontrolled environment as at UBC," he says. Yet he isn't about to write off biotechnology in the winemaking process. "Understanding how the wine yeast genome works helps us

understand the interaction of yeast with grape components, so that we can produce a delicious wine," he says, predicting that the use of grape and yeast genomics in winemaking will grow from a mostly experimental practice in the Okanagan Valley to become mainstream within only five years.

When I'm having lunch the following day with Tom DiBello at Crush Bistro in Vernon, at the north end of Okanagan Lake, the wine consultant echoes Soon's opinion not to discount the old ways when they work. "But if someone gives you a better paintbrush, you can push the boundaries. I've got two MLO1 wines fermenting right now," he says over a Pentage pinot gris. As far as he's concerned, the novel yeast works as advertised, but particularly well with chardonnay and pinot gris. Despite that, vintners who use MLO1 prefer to keep it under wraps. (Indeed, not a single person I ask will tell me who uses it.) "They're concerned their wines are not going to sell," DiBello says and finishes his spicy sausage pasta. "The perception among some consumers is it's Frankenwine, but it's safe. It's been approved by the U.S. Food and Drug Administration and by Health Canada."

Which makes me think of another of van Vuuren's patented wine yeasts. Engineered with health safety in mind, the strain cuts ethyl carbamate by up to 92 percent - a good reason to raise a glass since this compound, which occurs naturally in wine and other fermented drinks, has been linked to cancer. With these and other breakthroughs,

it's no mystery why oenology and viticulture students from such formidable wine-producing countries as Italy, France and South Africa choose UBC. And it can't hurt that, like their prof's job description, their curriculum includes the arduous task of drinking some of the finest wines on the planet. The day that I left UBC, I found evidence of this merry education in a glass cabinet: empty bottles of Chateau Margaux, which is still on my to-drink list, the Pur Sang sauvignon blanc I had just tasted and vintage champagnes I can only dream of. 28 October 2010. Enroute, aircanada.com.

Toxic Grass Puts Animals To Sleep

University of North Carolina, Greensboro researchers are studying native grasses to develop a better understanding of the workings of fungal endophytes.

Legend has it that five railroad surveyors killed by Indians in 1854 in New Mexico lost their lives because they unwittingly allowed their horses to graze on "sleepy grass," *Achnatherum robustum*, the night before. The next morning, under attack, the surveyors jumped on their horses to escape -but the animals were frozen in place. Without the means for a quick getaway, the workers were doomed.

Whether true or apocryphal--the story is unverified--it could have happened, considering the toxic effects of sleepy grass, also known as robust needle grass, which commonly grows in many western states and causes animals that eat it to turn into living statues--or, if they

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consume too much of it, even die.

"Native Americans are said to have fed a single seed to colicky babies to quiet them, and they--and ranchers--have fed small amounts to cattle to make them more sedate and easily managed when moving them from summer to winter ranges in the mountains," said Stan Faeth, professor of biology and head of the biology department at the University of North Carolina, Greensboro.

Moreover, in a book called "**Horse Tradin**," by Ben K. Green, the author recounts "how he bought a horse from the Mescalero Apaches in the 1920s which seemed tame and broken, but later found it was unbroken and wild--but had been fed a small amount of sleepy grass," Faeth added.

Sleepy grass has this effect because, like all plant species, it harbors microbial "partners," that is, microbes such as bacteria or fungi that "infect" the plant and live within plant tissues. The microbes can dramatically change plant growth and performance, frequently to the plant's benefit. Also, like plant and animal species, microbes also can hybridize and create new genetic species and variants.

Fungal endophytes, which are found in many types of grasses, make alkaloids which fight against drought and insects. But, as is the case with sleepy grass, these alkaloids also can be poisonous to animals--including humans.

"If ingested, infected sleepy grass--but only from a few selected populations--has the same effects on humans as in livestock," Faeth said. "One main alkaloid is lysergic acid amide--very closely related to LSD, but apparently without the hallucinogenic effects."

Faeth and his colleagues, who include Nadja Cech, associate professor in the university's department of chemistry and biochemistry, are trying to better understand the workings of fungal endophytes. Because their research could have broad implications for the multi-billion dollar livestock industry, as well as for the restoration of native grasslands and the management of forage grasses, the National Science Foundation (NSF) is funding the program as part of the American Recovery and Reinvestment Act of 2009.

In replenishing native grasses, for example, it would help to know whether seeds were infected before planting them. The knowledge also could help the turf grass industry in the planning and maintenance of recreation areas.

"You can plant grass with high endophytes in places where nothing is grazing--golf courses, for example," Faeth said. "The grass uses less water and resists insects. It's good for golf courses, but you don't want to plant it in pastures where it will make livestock sick."

Faeth's team has been conducting field experiments in Arizona on two native grasses--"sleepy grass", and Arizona fescue. The endophytes within Arizona fescue also make alkaloids but they are harmless to livestock.

The research team has created "common garden experiments" to understand how the endophytes work within the plant, and whether changing certain conditions can increase the grass's ability to survive and compete better in harsh environmental conditions.

"We take plants with different strains of endophytes and grow

them," he said. "Then we alter the factors that can change the endophyte effect on the host--such as water, nutrients and competition. The alkaloid production stays the same. We are looking at the plant's response in terms of growth and reproduction--how does the plant respond to these variants? We want to better understand how [endophytes] work."

Endophytes sometimes are not beneficial to the plants, depending on the strain. "We are studying this, as well," Faeth said. Although generally thought to be positive to plants, "most of our research is showing you can get highly variable effects," he said. Also, one section of land can have mixed strains containing areas with toxic-producing endophytes--or not. There's no way to tell without testing--although livestock, once sickened, will not eat there again.

Faeth and his colleagues also have been collecting native grasses in very remote mountainous areas of New Mexico--Lincoln National Forest, near Cloudcroft, for example--as well as insects from the plants. They want to test the effects of endophytes and their alkaloids on herbivores. "Just like livestock, endophytes may protect grasses from insect consumers," he said. 17 October 2010. Redorbit.com.

All four previous articles are from Nov., 2010 Spore Print, Journal of the Los Angeles Mycological Soc.

Articles for the next newsletter Deadline --May 22

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Calendar of Events

OMS Events

Email Jerry at jsp@pepera.net to receive notification of impromptu events. Check your most recent issue of the *Mushroom Log* for event updates and for more detailed information. Please plan to join us. All mini-and morel forays are subject to cancellation. Call first to confirm. Please bring a whistle and compass and an **RSVP to the host is mandatory** so they have cancellation flexibility.

April 23 (Sat.) Morel Mini-Foray, Deerfield, OH. 10 am. Meet at Circle Restaurant in Deerfield at intersection of St. Rte. 224 and 225. See page 8 of Jan/Feb 2011 Log for details or call/email Paul at (330)747-0959; pdanus1@hotmail.com.

April 30 (Sat.) Morel Mini-Foray. Salt Fork State Park at Cambridge, OH near the junction of I-77 and I-70. Meet at 9 am at State Park Office parking lot. Foray departs promptly at 9:30 am. Lunch at the Park Lodge. Sharon Greenberg (330) 457-2345.

May 7th. (Sat.) Beaver Creek Mini-Foray. Meet at 9:30m am at McDonald's in Calcutta, across from Tim Horton's. Directions: Exit Oh Rte 11 onto OH Rte 170. Go north for ca. 1-1.5 mi. McDonald's is on the left and meeting area is Ogilve parking lot just before McDonald's. Walt Sturgeon (330) 426-9833.

June 25 (Sat.) Mini Foray
Poland Woods, 10 am. P A Danus. Details tbd.

July 9 (Sat.) Mini Foray
Mohican State Park, meet at



Firetower at 10 am, Sharon Greenberg.

July 10 (Sun.) Mini Foray
Buckeye Trail, Hocking Hills, Shirley McClelland Time tbd, meet at Bob Evans in Logan.

Aug. 27 (Sat.) Mini Foray
Chance Creek. Dave Miller, same as last year, details tba.

Sept. 17 (Sat.) Mini Foray
Hocking Hills region. Andrea Moore, details tba.

Sept. 24 (Sat.) Mini Foray 9 am at Dawes, Dick Doyle, details tba.

July 23-24 (Sat. Sun.) Summer Foray, 2011.
At Dawes Arboretum. At Education Center and Greenhouse. Speakers: Noah Siegel on Name Changes & DNA Research; Erin Page Blanchard, tba.

Oct. 1-2 (Sat.-Sun.) Fall Foray

At the Wilderness Center, Wilmot, OH. More details tba.

Sat. Oct. 8. Miniforay Hiram College Field Station. Details tba.

Sat. Nov.12th or 19th. Annual Dick Grimm Banquet. Details tba.

Ohio & Regional

June 25 (Sat) John Plischke III will have a walk (4 pm) and slide show (7:30 pm) at Blackwater Falls State Park Nature Center. See <http://www.blackwaterfalls.com/>

Sat. Sept. 11 Annual Gary Lincoff Mushroom Madness. Guest speakers include Gary Lincoff, Tom Volk, and our own Walt Sturgeon. See their website <http://www.wpamushroom.org/> for details

Thurs. Aug. 11 – Sun. Aug. 14, 2011

The 2011 NEMF Samuel Ristich Foray will be held at Paul Smith's College in Paul Smiths, NY. For more information email Peter Molesky at pcmolesky@aol.com.

National & More

Aug. 4-7, 2011. NAMA 2011 Foray at Clarion University in Clarion PA. Hosted by the Western PA Mushroom Club. See NAMA's website at <http://www.namyco.org> for details and registration forms.

This is your chance to attend a NAMA foray in our own backyard! There will be fellow mushroomers from all over the country plus a number of professional mycologists as well. NAMA forays have numerous workshops which you can attend and learn about fungal topics you may not yet be familiar with

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Membership Application for the Ohio Mushroom Society

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____ FAX _____

EMAIL ADDRESS _____

Enclosed please find check or money order (check one):

- \$15.00 annual family membership (newsletter via email and website only)
- \$20.00 annual family membership (newsletter via paper, email, and website)
- \$150.00 life membership (newsletter via paper, email, and website)

My interests are:

Mushroom Eating/Cookery _____ Photography _____ Nature Study _____

Mushroom ID _____ Cultivation _____ Other (specify) _____

Would you like to be an OMS volunteer? In what way? _____

How did you hear about our group? _____

SIGNATURE _____

May OMS provide your name to other mushroom related businesses? Yes _____ No _____

Return form and check or money order to: Ohio Mushroom Society, c/o Jerry Pepera, 8915 Knotty Pine Ln., Chardon, OH 44024

2011 Ohio Mushroom Society Volunteers

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The Mushroom Log, the official newsletter of the Ohio Mushroom Society, is published bi-monthly throughout the year.

Contributions of articles and ideas for columns are always welcome. Articles may be edited for length and content.

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