

Connecticut-Westchester Mycological Association

Spores Illustrated



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www.comafungi.org
www.fungiphotos.net

President: Dianna Smith
Diannasmith@optonline.net
Membership: Beverly Leffers (718) 636-6348
Morrarian@juno.com
Treasurer: Donald Shernoff (914) 761-0332
Donshernoff@yahoo.com
Editor: Rena Wertzler (914)472-3575
Renawertzler@hotmail.com
Webmaster: Ursula Hoffman (212) 288-5460
Ursula.hoffmann@lehman.cuny.edu

**MERRY CHRISTMAS, HAPPY CHANUKAH,
A SWEET SOLSTICE,
AND A GOOD NEW YEAR TO ALL
COMA MEMBERS AND FRIENDS**



Letter from the President: YOUR ROLE IN COMA's FUTURE

Dear Fellow COMA Mycophiles,

The 2011 mushroom season has passed, and, like you, I am now waiting with anticipation for whatever surprises the New Year will bring. Mycologically, for me it will begin with COMA's Mushroom University workshop on gilled mushrooms. I hope many of you will also choose to join us this late winter for an eye-opening look at the fascinating world of fungi with Gary Lincoff. Our last class will be followed by a stroll through the woods in search of late winter's fungal treasures and early spring morels. Meanwhile, this moment is a time of reflection for me about my past and future contributions to our club as this will be my final year as COMA president.

During the past eight years, my mission has been the same as COMA's main mission, to promote mycology education among our members and the community. To that end, I assumed many fulfilling tasks. Looking back, I have done a lot of things with the club over the past eight years. They include COMA's participation in three community bio-blitzes; giving numerous presentations to both our club and nature centers and parks in NY and CT; the creation of an introduction to mushrooming tape and DVD for beginners featuring Don Shernoff; videotaping and airing on community cable television our educational programs; assisting Don with organizing the annual Clark Rogerson foray; representing COMA as NEMF 2010 foray chairperson; creating a website that records the fungi we find on our scheduled walks (<http://www.pbase.com/comafungi>); improving communication and information exchange by sending out weekly e-mails to members reminding us of programs, walks and forays; serving as a regional mushroom identifier for Long Island and Westchester poison control centers; initiating Mushroom University six years ago to promote fungi education for our members; and building two educational websites featuring my take on the lessons we learned under Gary Lincoff's tutelage (www.fungikingdom.net and <http://www.fungiphotos.net>). I also served as membership chairperson and vice president for three years each.

I will be passing on the tasks of COMA's president to one of you next fall. I don't expect any future president to necessarily assume all the various responsibilities that I had the time and interest to undertake. My goal during this final year is to encourage more of our club members, young and mature, to get involved in running COMA. With that aim in mind, I have been working to have some of our younger members join our Board of Trustees. There is Djerba Goldfinger, who is now writing my weekly notices on upcoming walks and programs – and doing a much better job than I did with it! Stephanie Scavelli and Taro Ietaka, also new board of trustee members, are host and publicity chairs respectively. They have all offered to help us whenever called upon. These people are COMA's present and future leaders. I urge you to get to know them.

I would especially like to acknowledge with deep gratitude the contributions of the following illustrious members, who, year after year generously donate their time and talents to our club: Don Shernoff, our treasurer and Clark Rogerson foray registrar; long-time program chairman and former club president David Rose; Rena Wertzer, editor of COMA's newsletter, *Spores Illustrated*; Beverly Leffers, our membership chairperson and her husband, Morris (also a previous COMA president); Ursula Hoffmann, our COMA website master; Zaac Chavez, our

walk schedule chairperson; vice president Kathy Americo who stood in for Lou Tartaro as our 2011 banquet chairperson; Lisa Solomon for maintaining our Facebook presence; Joe and Kathy Brandt who tended to our insurance needs, and took charge of each of our daily mycophagy sessions during our foray at The Hemlocks; and John Michelotti for leading our new monthly weekday walks. And I also thank COMA's first president, Sandy Sheine, for her wise advice and constant support. All of these people are the heart of COMA, keeping the club healthy and dynamic. I could not have done my job without their contributions and creative ideas for making COMA relevant for both the larger community and our membership. COMA, like all other non-profit organizations, depends on its membership to keep it viable and thriving. With the active involvement of more of you in our various activities, COMA and its members will be a vibrant force in the future of amateur mycology.

Dianna Smith



Distant Harvests (the Christmas edition)

Susan Goldhor : President of the Boston Mycological Club

My guess is that by the time you read this, it will be more or less Christmas time. So let's talk about Santa Claus. Surely you've wondered about this bizarre figure. We know that Christmas is really a palimpsest over the real celebration which is that of the winter solstice. I'm ignoring Chanukah, whose candle-lighting is another winter solstice solace, but which was originally a very minor holiday that got inflated into a major one so that Jewish kids wouldn't be too jealous of their Christian neighbors. It doesn't really work, of course, because seven candles can hardly compete with a whole lit up tree and, no matter how many presents you get, you don't have the thrill of their arriving via a flying sleigh, pulled through the night sky by reindeer. Somehow, the Christians get it all. Not just the baby in the barn with the whole farm menagerie, and the three kings, and the shepherds, and the stars and the angels, but the fir tree, and the reindeer, and the thrilling ride through the night sky that magically gets to every home, and the delivery of presents via the chimney by a fat man in a red suit with white trim.

No doubt you can tell that I have given a great deal of thought to and made a serious study of Christmas. The bottom line is that Christmas, at least as celebrated in America, simply doesn't

make sense. Theoretically, it celebrates the birth of Christ. This gives us the crèche, the angels, the kings, etc. Now we come to the tree, which is invariably a type of evergreen which does not grow in the holy land and which is often decorated with fake snow. This is usually explained by its being a pagan holdover, especially beloved by Germans and other northern peoples, who were into celebrating the solstice. I can appreciate this, being pretty much pagan myself. Who wouldn't appreciate the greenery, the lights, and the wonderful smell during the darkest, most indoor time of the year? The attempts to explain Santa are pathetic. Is he a third century Greek saint named Nicholas who is said to have given some gifts to poor people? It's true that the name of Santa Claus is derived from Nicholas' Dutch name (Sinterklaas), and it's also true that Sinterklaas gives gifts to good children. Let us not forget, however, that he also comes from Spain by boat (switching to horseback when he reaches land), and takes bad children back to Spain with him, which makes some sort of sense when you think of the bloody works of the Spanish Inquisition in the Lowlands a few centuries ago and the dread they inspired. But where do we get the red and white costume, the round tummy (unsuited for a serious and probably gaunt saint and martyr), the North Pole locale, the flying reindeer, and the descent down the chimney? Where do we get the total non-Christian *weirdness* of this character? Even given the way he and his reindeer have been trivialized and cartooned, which makes him look like a Disney escapee, where did he originate? And the answer that I prefer above all others, is that Santa comes from Lapland, with forays into Siberia, and the shamanic use of *Amanita muscaria*, a widely used hallucinogenic and entheogenic mushroom. It's a safe bet that *A. muscaria* is the most recognizable mushroom in the fungal pantheon. With its brilliant red cap (apologies for the fact that it's often orange or yellow in our region), decorated with white warts, it has been called one of the most photogenic mushrooms in the world (by Gary Lincoff, who has an article about it in an issue of *Mushroom the Journal*). And, it is probably the most painted mushroom in the world, appearing in children's books as different as *Alice in Wonderland* and *Babar*, to say nothing of infinite depictions of evil or enchantment or rituals -- although not rituals affiliated with religions commonly practiced here. If you were asked to illustrate a fairy tale toadstool, it's a safe bet that you'd use *A. muscaria* as your model. Found under birches and evergreens, it has a wide distribution -- not only in the circumpolar regions, but much further south. However, given Santa's North Pole habitat, let us concentrate on the northern habitats and particularly on Lapland and Siberia, following the lead of BMC member, northern explorer and writer, Larry Millman in his fictionalized/hallucinatory essay which appeared in last winter's *Fungi* magazine.

Larry starts his *Fungi* article as follows: "In 2003, I was traveling through the Chukotka region of eastern Siberia when I happened to eat Santa Claus. Or maybe I should say that I ate the mushroom traditionally eaten by certain shamans before they became Santa Claus. Or maybe I should just say that the composite figure of Santa Claus consists of, along with historical figures like Saint Nicholas, an anonymous shaman high on an entheogenic mushroom." He goes on to point out that Santa's shape is the plump, rounded shape of the mushroom, and much more.

Why Lapland along with Siberia? Well, for one thing, this is the home of reindeer herding as opposed to caribou hunting. One should note that if reindeer have any passion outside of rutting season, it's for *Amanita muscaria*, either the whole thing or those fractions remaining after it has passed through a set of human kidneys. Deer generally love human urine, which is a source of salt, and urine from an *A. muscaria* consumer must be absolute manna for reindeer. Honesty (and a small desire to shock) compels me to announce that reindeer are not the only consumers of

post- *A. muscaria* human urine. *A. muscaria* contains both hallucinogenic and pathogenic compounds. The ratio of gain to pain varies; the North American species are said to contain more pain; the European, more gain. However, one nifty trick which has been widely discovered is that in passing through the human body, the hallucinogens come out in the urine relatively untouched while the toxic compounds are metabolized. Thus, if you're not overly fastidious, there are some real benefits to being a secondary consumer and in some northern cultures, the shaman will ingest the mushroom, and the ordinary folks, his urine. Richard Platt writes from England:

Lapp shamans used to eat the mushroom during the midwinter pagan ceremonies of Annual Renewal. The first effect of eating it was a deep coma-like slumber. When the shamans woke the drug stimulated their muscular systems, so that a small effort produced spectacular results – the intoxicated person perhaps making a gigantic leap to clear the smallest obstacle. The effect on animals was generally the same and a mushroom-maddened super-reindeer traditionally guarded each shaman. When missionaries first reached Santa's native Lapland, they found a thriving pagan myth of reindeer flight. Rather than oppose it, they shrewdly assimilated the stories into the folklore of Christmas and Saint Nicholas. The color scheme of his outfit is taken from the unmistakable red and white cap of the fungus. Lapps still scatter the mushroom in the snow to round up reindeer.

In addition, the Siberian winter dwelling, or yurt, had a smokehole in the roof, supported by a birch pole. At mid-winter festivals, the shaman would enter the yurt through the smokehole, perform his ceremonies and ascend the birch pole and leave." (Note: Siberians revere the birch tree and a sacred serpent is said to dwell at its roots. This is not a casual connection -- the mycorrhizae of *A. muscaria* also dwell at the birch trees' roots. There has been a fascinating conflation over time of the Tree of Life and the Tree of Knowledge, and at least one authority says that *A. muscaria* is the apple of that tree.) In any event, Judeo-Christian-pagan mythologizing aside, there's your chimney connection.

Continuing the birch linkage, Gary Lincoff, on the website given below, states:

The Koryaks use only this mushroom (*Amanita muscaria*) and no other [. . .] an Even shaman, uses a few other mushrooms, such as the medicinal clinker fungus (*Inonotus obliquus*), but only those that occur on or about birch trees, which tribal peoples in the Russian Far East regard as sacred. In Kamchatka, one birch in particular, the endemic *Betula ermanii*, is believed to be the pathway between the world we know, the upper world, and the underworld: a ladder is sometimes made of birch wood to give the shaman a visual means by which to ascend or descend in the shaman's journey to effect a cure, offer protection from evil spirits, or secure a successful hunt. [When we tried to present the Koryaks with a gift of dried *Amanita muscaria* from Colorado, not only would they not accept it, but they told us they would not even use *Amanita muscaria* from the mainland, just a few miles across the Sea of Okhotsk. They only use the fly agaric associated with their local birch tree, which they regard as sacred, all others being profane.]

In the interests of full disclosure, I must mention that some experts deny that Santa sprang from the imbibing of *A. muscaria*., stating that they are not impressed by the evidence. The problem is that I have yet to read a good alternative theory. Do we note that Santa's shape and dress bring to

mind this magical mushroom? Do we allow that *A. Muscaria.* is widely used to achieve an alternative state of consciousness, which endows the imbiber with almost supernatural strength and the feeling of flight? Do we admit that reindeer love it and that reindeer are absent from Anatolia, Holland and other putative Santa origins? Do we agree that Santa, with his northern home, is unlikely to have spring from an Anatolian saint? To me, one of the most powerful arguments for a strong linkage between Santa and *A.muscaria* is the introduction of flying into the legend. Although I draw the line at believing that those who eat *A.muscaria.* can fly, I do believe that they experience a surge of strength and may feel as if they are flying. Mycologist Gary Lincoff (who has a related article in the last winter's issue of *Mushroom the Journal*, entitled "Magic Mushroom Therapy: Effective Medicine or Snake Oil"?) also has a report on the internet telling of his own experiences swallowing 5 grams of dried *A.muscaria.* after visiting Siberian Koryak shamans. (You can access it at: <http://www.nemf.org/files/various/muscaria/part2.html>.) Here are the relevant extracts from Gary's report:

A reindeer herd manager we interviewed told us that some of his herders ate the *Amanita muscaria* when they had to chase after runaway reindeer: the mushroom allowed them to go for long periods of time without stopping to eat or rest."

At dinner, I rose to make a toast to our Russian guides. As I stood up, I pushed my chair behind me. It hit the wall and broke in several pieces."

On leaving Kamchatka the next day by plane, I tried to attach my seat belt and pulled it out of the seat."

Two weeks after returning home I was still feeling the effects of the relatively small amount of the fly-agaric mushroom I had consumed. The primary effect was a sense of power, an upwelling rising from my stomach.

The number of stories about flying, from cultures that use *A.muscaria* are impressive. Returning to the Koryak, the English mycologist, John Ramsbottom relates a story about the fly agaric (wapaq) which enabled Big Raven to carry a whale to its home. In the story, the deity Vahiyinin ("Existence") spat onto earth, and his spittle became the wapaq, and his saliva becomes the warts. After experiencing the power of the wapaq, Raven was so exhilarated that he told it to grow forever on earth so his children, the people, can learn from it. (quoted from Wikipedia) The Norse deity, Wotan, flies through the sky in a vehicle pulled by animals, and drops of blood from his steed are said to be the origin of *A.muscaria*.

Yes, Virginia, there *is* a Santa Claus, but he's a Lapp/Siberian shaman who's high on psilocybin.

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And a short parenthetical excursion: before leaving Christmas, may I draw your attention to Tom Volk's website (<http://tomvolkfungi.net/>), which not only lists his fungus of the month, but also his holiday fungi. His current list of fungi necessary for a merry Christmas includes not only *A. muscaria*, but also *Cladonia rangifera* (one of the reindeer lichens), *Saccharomyces cerevisiae* (brewer's and baker's yeast, without which we would have neither bread nor alcoholic beverages, *Daldinia concentrica*, the coal fungus (for the stockings of bad children, I assume), and *Asterophora lycoperdoides*, the star bearing powder cap mushroom.

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And, before leaving psilocybin, new findings are emerging on that front, the most amazing of which is not what this substance can accomplish, but that it is now being accepted as a therapeutic and entheogenic agent by the medical/psychiatric establishment. Those of us old enough to have experienced the trippy 60s and 70s remember magic mushrooms (psilocybin and lots of other stuff mixed in) and cactus buttons (mescaline and lots of other stuff mixed in) being used and abused with wild abandon. Since doses were unmeasured, mixtures unknown, and the folks swallowing the stuff hardly the most stable, it probably shouldn't have surprised anyone that bad trips became common, with psychotic breaks and suicide attempts (some successful) part of the game. But, prior to this popularization of hallucinogens, starting in the 40s, a decade after Albert Hoffman synthesized LSD, "more than 1,000 scientific papers were published on psychedelics, and some 40,000 people took them in clinical settings. With compounds supplied in bulk to psychiatrists by drug manufacturer Sandoz, the field drew smart, ambitious researchers, not to mention celebrity test subjects . . . Bill Wilson, founder of Alcoholics Anonymous, took LSD with psychiatrist Sidney Cohen (later head of the National Institute of Mental Health's drug abuse division) and compared the experience to those that catalyzed his sobriety; he tried unsuccessfully to make the drug a part of the AA program." (Quoted from "A Trip to Therapy", Fall 2010, Proto Magazine, published by Mass. Gen. Hosp.) Psychotropic drugs seemed to have enormous and incompletely understood promise for a wide variety of conditions almost impossible to treat by other means, including severe migraine cluster headaches, obsessive-compulsive disorder, and the overarching depression accompanying a terminal diagnosis. And then, all the work was dropped, and institutional support for the projects and the substances disappeared. Psychiatric research lost a promising treatment for conditions that were then, and still remain, essentially untreatable and devastating.

It's good news that a few stalwarts are using psilocybin again for medical research, with new publications appearing in the journals. The MGH article (you can download it easily from protomag.com if you want to read it in full and get further references) specifically mentions the work of Charles Grob, a UCLA psychiatrist who has used it successfully to treat terminally ill patients, unable to enjoy the time they had left, because of the severe depression that accompanied the diagnosis. (Federal law still acknowledges no medical uses for psilocybin but, like the massive supertanker that takes miles to change course, the government is rarely a rapid regulatory responder.) In fact, the more I read about psilocybin (note that the researchers are using measured doses of the pure substance in a very carefully monitored clinical setting), the more impressed I am by its power and potential for granting medical and spiritual well-being. Isn't it amazing that we've accepted Santa's red and white outfit, his northern origin, his flying reindeer, his chimney habit, and his bulging mushroom shape for so long, while ignoring the real gift that he brings?

Happy Solstice to all and to all a good night!

MUSHROOM UNIVERSITY 2012 by Dianna Smith

Hi everyone! It is that that time of year again. It is time for new beginnings and to think about preparing yourself to tackle the next season of mushrooms with more knowledge and an enhanced appreciation for the world of fungi. You can get that on your own by reading field guides and other books during the otherwise long winter months. Or you can join us for six Saturday sessions in March and April to learn with a friendly group of like minded-mycophiles turned students

COMA's Mushroom University is going to be in its seventh successful year! During 2112, students will meet between 10:00am and 2:00pm on the following dates: March 3, March 10, March 24, March 31, April 14 and April 21. For the past few years we gathered at my house in Croton on Hudson for our workshops. But for this next season of learning, we will more likely be meeting at the Westchester County Park's, Muscoot Farm. It is located on Route 100, not far from the Taconic Parkway, Route 35 and Route 684. There we will be able to spread out more and use the kitchen for cooking up mushrooms for occasional tastings. Our principle topic of study will be gilled mushrooms. Yes, it's true there are so many different kinds to boggle the mind. But our professor is none other than Gary Lincoff, author of *the National Audubon Society Field Guide to North American Mushrooms*, *The Complete Mushroom Hunter*, and many other publications. Gary will help us make sense of it all so that we will be able to identify mushrooms we find on our walks at least to genera. We'll also focus on the roles fungi play in the environment and the habitats with which they are associated. Assuming you do additional reading on your own, you will definitely learn about far more mushrooms than you know now. If we meet at my home, we have room for 22 tightly packed students. If the location of Muscoot Farm is confirmed, we will be able to accommodate several more. In either case, registration is limited. ***To reserve your place in MU, send a check made out to COMA for \$110 and send it to me: Dianna Smith, 30 Fox Run Road, Croton on Hudson, NY 10520.*** Mushroom U. always fills to capacity fast, so don't wait too long to sign up for this great workshop with Gary Lincoff. MU is open to all members of COMA. To participate, your 2012 dues have to be paid up. The cost for the entire series of workshops is just \$110 payable in advance of the course. This is significantly cheaper than taking Gary's course at the Botanical Gardens. No refunds can be issued for missed classes, but you will receive handouts of any lesson you miss.

An abundance of hens at the Ed Bosman Memorial Walk photo: Rena Wertzler



Generous members of COMA and CVMS shared with those who found less.

A Gathering of Friends! COMA's 33rd Clark Rogerson by Don Shernoff

This Labor Day weekend we returned to Camp Hemlocks in Hebron, CT for the first time in ten years. It was memorable for many reasons. Mycophagy was fantastic. Foraging was fantastic. The multitude of mycologists was unprecedented. They were David Arora, author of *Mushrooms Demystified*, Erin Blanchard, Roz Lowen, Cristina Rodrigues, Christian Schwartz, Leon Shernoff, editor of *Mushroom the Journal*, Noah Siegel and Rod Tulloss. Also present were Sandy and Jerry Sheine, Bill Yule and our president, Dianna Smith. Beginners did not lack for teachers

Paula DeSanto and Stacey Kalechitz spent many hours helping with the sorting process. Ursula Hoffmann was our recorder. Our 70 attendees came from all over the country, California, Connecticut, Illinois, Massachusetts, Michigan, New Jersey, New York, Rhode Island and Brooklyn; filling every bed in the main building and several beds in the smaller, adjacent ones.

Holding a foray soon after a hurricane makes for terrific mushrooming. On the first morning we gathered a pound of edible *Laccaria ochropurpurea* in a small grassy area between the parking lot and the main building. Several more pounds were gathered that afternoon and saved for mycophagy. The nearby state parks, Salmon River, Devil's Hopyard, Hurd, Day Pond and Meshomasic were carpeted with mushrooms. You could hardly move without stepping on a russula or an amanita. We harvested thousands of specimens and tallied over 300 species. We gathered baskets of amanitas to the delight of amanita expert, Rod Tulloss. Many of the amanitas were "new to science," as our old friend Sam Ristich used to say.

Carol Levine collected a wide variety of plants and displayed them for all to examine. She then gave a class on identifying the array of genera and species. The attentive audience had many questions for Carol, as she tried to teach us the differences between sedges, reeds and grasses.

Due to the large harvest and the skill and hard work of Kathy and Joe Brandt, mycophagy was fantastic. (Did I say that already?) Aided by a coterie of sous chefs, the mycobanquet covered two large picnic tables near the main building each day. It included:

Saturday – Puffball lasagna with oyster mushrooms, Wine-caps with fennel & noodles, Cinnabar-red chanterelles on saffron rice, Fried skull-shaped puffballs, Purple-gilled laccaria with onions & garlic, Mixed chanterelle zucchini squares, Croustades with black-staining polypore tomato sauce, Butternut lasagna, Lactarius ratatouille, Black trumpet cream cheese spread, Umbellatus & Hen-of-the-woods with onions, Caesar salad, Hummus.

Sunday – Shiitake soup, Golden chanterelle pizza, Black trumpets, red beans & yellow rice, Chicken mushroom marinara, Purple-gilled laccaria with poblano peppers, Honey mushrooms with peppers & onions, Lobster mushroom & zucchini quiche, Lactarius veggie squares, Green russula sauté, Wild mushroom jumbo jambalaya, Black trumpets w/ teriyaki glaze, Boletus pilaf, Black trumpet dip, Tomato salad, Guacamole. Lou Tartaro also brought a tomato salad, made with tomatoes from his garden.

Between bites of food, people also tossed a few basketballs at a nearby hoop. Bill Yule displayed a fine touch, while shooting from the corner. David Arora made jump shots from all angles. Eva Goldfinger, who is seven years old, was delighted to get the ball in the basket once. Leon Shernoff displayed good body control against Noah Siegel's stiff defense. Wanda Palmer worked on her set shot. Rhoda Roper, Erin Blanchard and Sandra Boer scored for the women's

team. Next year we are going to have a foul-shooting contest and a game between COMA members and “the rest of the world” for the World Fungus Cup.

During dinner, we celebrated the presence of four of our octogenarians. Sandy Sheine presided over the ceremony, dividing a small birthday cake into four pieces and presenting them to Jerry Sheine, Carol Levine, Rhoda Roper and Marcia Jacob. The evening presentations were quite varied. David Arora showed pictures from his travels, including images of giant edible mushrooms that grow on termite mounds in Africa. Roz Lowen described the process of assigning scientific names to mushrooms, including several that she had named. Leon Shernoff conducted the “Chotchka” auction with his usual wry wit. The silent and live auction were financial successes, aided by Dianna Smith’s generous donation of books.

After the evening programs, several people brought out board games and played at tables in the cafeteria and near the pool. I hope that people bring more games next year. We are starting now to accumulate items for next year’s COMA foray auction! So bring your old mushroom books and Chotchkas to club meetings and our dinner to help us make next year’s auction bigger and better than ever. We have already scheduled our 2012 foray. We will be returning to the Hemlocks from Thursday, Sept. 13 to Sunday, Sept. 16, so save the dates and save the Chotchkas!

Field Notes from a Traveling Mycophile

Stephanie Scavanelli

Saturday, December 3rd, 2011

Georgetown, TX

Location: Roadside patch of Mixed Ash Juniper (*Juniperus ashei*) and Escarpment Live Oak (*Q. virginiana*, var. *fusiformis*) Woods



Up until my recent arrival in Texas, the region had experienced the latest episode in its quarter century cycle of severe drought. Today Texas received 0.10 inches of rain with an inch more forecast for the coming days. Feeling I was one of the first to witness the return of fruiting mushrooms to this parched landscape, I am privileged to have wandered across this newly formed sporocarp, possibly only a few hours young! I curbed my desire to pick this amanita-like specimen. In so choosing self-discipline, I acknowledged my friend’s appearance to be a warm welcome to Texas.

The Importance of Nature Education – Taro Ietaka

Until the age of 30, I couldn't tell a beech from a birch or a tiger beetle from a dung beetle.

Why is that important? "Losing their names is a step in losing respect. Knowing their names is the first step in regaining our connection," says Robin Kimmerer in her book, *Gathering Moss*, and it is true. Imagine this sequence of events: child sees mushroom, child promptly punts mushroom across forest floor. Now compare it with this: child sees a Two-colored Bolete, lies down, scratches the pores to watch the color change, then leaves the mushroom in peace. Learning a mushroom's name, or a bird's, or a flower's, is like making a friend. It sets that species apart from what can be an overwhelming blur of feathers, leaves, and fur. It is also the first step towards a true conservation ethic. How can this be? Just remember your last drive on I-684 or your last visit to the comments area of a newspaper's website: people tend to be much crueler and more inconsiderate if they are dealing with anonymous strangers. Likewise, it is much easier, psychologically, to bulldoze a stand of nameless trees than a grove of Flowering Dogwoods, maples, mayflowers, or morels.

Knowledge leads to respect, which leads to conservation. Unfortunately that chain's weak link is right at the base. Most people can't identify a bird unless it is on a baseball cap or football helmet. All evergreens are pine trees, right? And it is not their fault - schools don't teach natural histories, including universities that issue degrees in biology. Parents often don't have this knowledge to pass on either since there was no one to impart it to them. Those who do have the knowledge are often in clubs like COMA or Audubon, although members often don't have the time or teaching skills to educate large groups of children or adults. Well-meaning television shows and books often educate about rainforests and endangered species, but that knowledge is not as immediate or relevant as a guided walk through our local woods. This leads to the importance of local nature centers where trained staff can impart both love and knowledge of the natural world to the public. As an employee of one such place, I have seen first-hand how contagious both wonder and enthusiasm can be. I have been a spokesperson for slime molds, a peddler of puffballs, an evangelist for elms, and a pusher of poplars. During the recent budget proposal to close nature centers I saw some of the same children I had taught, write letters and speak out passionately at public meetings to support the parks that they had grown to love. And it worked. They have preserved some of our preserves for another year. Knowledge led to respect, led to conservation.

To save the environment, teach the children to love it. If you can, go for a walk with your grandchildren and share your own personal experiences and knowledge of the outdoors. Encourage local schools to use their grounds as living classrooms. Support your local nature center by joining a Friend's group. Tell local leaders to invest in the environment by investing in its educators. Tell large environmental groups that the best way to gain new members is not to send out free giftwrap or calendars, but to support local nature centers that are grooming future members with each guided walk in search

of dragonflies, polypores, and orchids. Each introduction of frog or mushroom or turtle that an environmental educator makes to a child could be the start of a beautiful friendship.

The article above, written by Taro Ietaka, COMA board member and curator of Cranberry Lake Preserve, was inspired by recent events surrounding the debate over funding of the Westchester County Parks. Some of us, especially those of us not living in Westchester, may not be aware of the conflict that has been raging over the possibility of not funding the parks. For many weeks the possibility of the parks losing their staffing was very real. Cranberry Lake, Marshlands, Ward Pound Ridge - many of our favorite places - were all in danger of losing their staffing and having to cancel the many educational programs which the parks provide.

Because of alerts sent out by grass roots groups like COMA and all of the Audubon chapters, there were many who attended the three budget hearings which were open to the public. The loud demand to keep these programs open resulted in a decision to continue the funding for the parks. The parks are safe, for now, but if we care, we must stay aware of what is happening and through our grass roots organizations and Friends of Parks remain strong advocates for continuing efforts to pass on our love and knowledge of nature and our desire to preserve and conserve what we have.

Rena Wertzer, editor

John C. Michelotti

December 9, 2011

Mycorenewal Adventures

As the Mycoworld continues to amaze me, I delve ever deeper into the ways mushrooms can be practically applied to help the planet and its people. When I learned that mushrooms have been used to remediate oil contaminated soil, I became fascinated with mycoremediation.

An experiment in Washington State found that after one month of growing *Pleurotus ostreatus* (oyster mushrooms) on a pile of bunker C fuel and diesel contaminated soil these soils were detoxified. The experiment demonstrated that the external digestive enzymes of the *P. ostreatus* mycelium had broken down the hydrocarbon bonds, biodegrading the hydrocarbon compound into benign molecular byproducts for subsequent incorporation back into the mycelium. Essentially, the roots of the mushrooms were eating the oil! The fruiting bodies, which showed no signs of petroleum hydrocarbons, attracted insects and birds that carried seeds which germinated in the pile. Soon the pile was lush with grass and wild flowers. The mushrooms had taken a toxic pile of dirt and recreated it into a diverse habitat.

Scientists have found that the mycelium also absorbs heavy metals that are stored in the fruiting body of the mushrooms. What can we do with these metal-meddling mushrooms? Removal and incineration is possible, but another option is to sprinkle the mushrooms as mulch in a bin of red wiggler worms. The worms eat the mushrooms, and castings can be sprinkled underneath trees such as black walnut which absorb the heavy metals into the tree without any traces of metals in the edible nuts. The metals would be relatively safe, stored in the woody trunk of the tree, just as long as the trees are not used to make baby cribs or spoons, exposing the metals to others, when they are cut down.

I searched out opportunities to study and work with mycoremediation and found very little until I came across Amazon Mycorenewal Project (<http://amazonmycorenewal.org/>). The Amazon Mycorenewal Project (AMP) is a non-profit that studies how mushrooms can remediate oil spills in the Ecuadorian Amazon. As seen in the documentary "Crude," there are 18.5 billion gallons of toxic waste that Texaco (now Chevron) left in 627 unlined and overflowing pits in one of the most biodiverse rainforests in the world.

Over the summer, I did an internship with AMP in Ecuador. While with AMP, I met biologists, mycologists, microbiologists, international remediators, and health practitioners to visit some of the sites suffering from environmental/humanitarian devastation in order to see how we could help. We collected corn straw (paja), cocoa shells, saw dust, straw, cardboard, and burlap in the towns of Mindo and Lago Agrio for use in experiments to test predictions about which substrates are best for cultivating *P. ostreatus* (oyster mushrooms).

We heated the substrates in water to kill any competitor spores, then, cooled the substrates before mixing in a jar of inoculated grain spawn. Prior experiments showed that the optimal ratios of mycelium spawn to substrate grow at 20% to 80% given our low tech methods and open air, tropical climate. As part of our experiment, we filled baskets with the different substrates in various combinations. Two weeks later, we found the optimal combination of available substrates. Now we could put the mushrooms to the test.

We set up buckets with our favorable substrates with layers of contaminated soil. This test was to see how vivacious the mushrooms would be in different ratios of contaminants. After three months, soil samples were sent to a lab to test for total petroleum hydrocarbons and other contaminants. We inoculated and bagged the leftover substrate and helped our happy host family grow reishi, shiitake and oyster mushrooms that were cooked in their restaurant in Mindo.

Throughout this experimental process, we also spent a great deal of time in the class room learning how to conduct the experiments, how to identify mushrooms, and many other mushroom related topics. We learned from molecular biologist, Monica Neff, about a company she started called PowerShroom (www.PowerShroom.com). PowerShroom sells capsules and powdered supplements made from different combinations of reishi, oysters, cordyceps, shiitakes, and other medicinal mushrooms.

There were also opportunities to teach mushroom programs at schools and outreach to indigenous people about the health benefits of growing medicinal edibles. We visited the Secoya tribe and went on a rainforest walk with one of the shaman's descendants. He showed us roots that are stimulants which are more powerful than

caffeine, stems used as antibiotics, numerous plants that cure different cancers, vines prepared for spirit journeys, and other cures for ailments from liver disease to poor circulation. Mushrooms, however, were overlooked within most of their ethnobotanical heritage. The son of the shaman in the Secoya tribe seem pleased when we showed him a *Ganoderma lucidum* in the rain forest and explained that a tea made with it has antibiotic, anti-tumor, and anti-inflammatory properties in addition to reducing blood pressure and cholesterol, and providing kidney, liver, and cardiovascular support.

Throughout the course with AMP, we had time for some scenic mushroom walks. While few edible fungi were found, we were able to collect samples of native mushrooms. We attempted to evaluate these native fungi for potential in remediation. It would certainly be preferred to remediate using a native species rather than introducing a non-native species into the ecosystem. One bright orange mushroom, *Pycnoporus sanguineus*, was found growing from the oil soaked wood beams and on logs in the oil pits. In order to culture *P. sanguineus*, we created a sterilized mini-lab and attempted to grow the mushroom in a petri dish to test its potential for remediation, but unfortunately, the dish became contaminated.

If future experiments and field research can prove that mushrooms can remediate soil effectively, AMP has the potential to teach the people of Ecuador how to clean up the oil that pollutes the rainforests and rivers. As a part of AMP, I strive to educate people and help them use their on-site resources and evaluate what substrates are available to grow edible and medical mushrooms. In addition to the Ecuadorian Amazon, the Kingdom Fungi has many applicable uses in mycoremediation, education, and medicine locally within our own towns. Through education and the utilization of our local resources, we have the potential to clean up the earth and feed and heal people worldwide. t

You can view pictures at:

<http://s1104.photobucket.com/albums/h325/AMPCFI2011/Johns%20AMP/#!cpZZ1QQtpZZ16> If you have any questions or would like to hear more, I am always happy to talk about it. Send me an email (RCypher7@gmail.com).

Thanks for your interest. :-)

Pleurotus ostreatus (Oyster Mushroom)



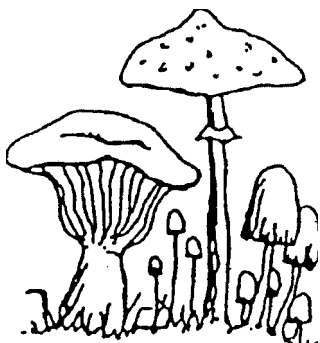
Photo by Miles Oleskiw on the website: MushroomExpert.Com.

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Many thanks to all our members who made contributions to *Spores Illustrated* throughout 2011. Please continue. It has been wonderful having so many participants. If you have never contributed, give it a thought. All mycomusings are welcome. Frequent flier miles are the reward for all first time contributors.
Rena Wertzler, editor

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COMA
8 Coralyn Road
Scarsdale, NY 10583