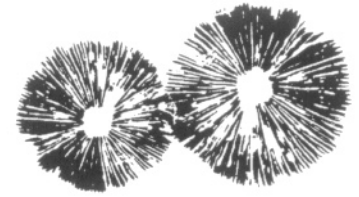


# SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY  
Number 431 April 2007



## AGARICUS MOELLERI: A New Name for an Old Friend

Brian Luther

Years ago (early 1970s and before) we used to call our flat top *Agaricus* either *Agaricus placomyces* or *A. meleagris*. When Alice Freeman (The Univ. of Tenn.) revised the genus in 1979, however, she determined that the flat top *Agaricus* from the SE US required a new name (= nomen novum), so she re-named it *A. praeclaresquamosus*. This name has been in widespread use ever since, appearing in numerous mushroom books, field guides, and the mycological literature. Alas, that name must now in turn be changed.

According to the *International Code of Botanical Nomenclature*—a sizable volume of rules, regulations, and recommendations that must be abided by for a botanical name to be valid—if an earlier, *validly published* name for a species is confirmed to be precisely that species, then the older name must be adopted and used. This is exactly what happened with *A. praeclaresquamosus*. It was recently determined that an earlier name for this species was previously validly published by the Ukrainian mycologist S. P. Wasser in 1976. Alice Freeman combed the literature but most likely because this article was in an obscure publication in Russian, she overlooked it.

The new, valid name, which we now need to start using and getting used to for *A. praeclaresquamosus*, is *Agaricus moelleri*, which was published three years before Freeman's new name was published. Thus, *A. praeclaresquamosus* is now a synonym of *A. moelleri*. Put a note in your favorite mushroom book or pencil in the new name as a reminder.



Walt Ketola

*Agaricus moelleri* (= *A. praeclaresquamosus*)

Alice Freeman and I were graduate students together at the Univ. of Tenn. in the 1970s and I have fond memories of our discussions about the genus *Agaricus*.

We still seem to have some undescribed species of *Agaricus* in the PNW, but some of these may turn out to have already been published as new species elsewhere in the world.

## References

- Freeman, Alice. 1979. "Agaricus in the Southeastern United States." *Mycotaxon*, 8(1): 50–118.  
Wasser, Solomon P. 1976. *Novosti. Sist. Nizsh. Rast.*, 13:77.

## ODD MUSHROOM HABITATS

Nick Iadanza

*MushRumors*, Oregon Myco. Soc., March/April 2007

In fact-checking an article submitted to *MushRumors*, we ran across information on some unusual microhabitats that are colonized by fungi. We're all used to seeing the obvious mushrooms, but a closer look at some interesting ecological niches can be rewarding. The next time you're strolling through the woods, check out:

**Sap:** In coniferous forests, old deposits of hardened resin on standing trunks harbor a unique phylum of cup fungi, e.g., *Retinocyclus*.

**Hollow trees:** Standing trees or recently fallen hollow trees may host fungi like *Ossicaulis*, which fruit almost exclusively inside trunks.

**Animal remains:** There are macrofungi that frequent vertebrate corpses or burial grounds. The concentrated release of nitrogenous matter appears to be the main stimulant for growth. *Tephroclybe tylicolor* can be found around animal corpses, on human feces, and sites with nitrogenous sources. On horns or hoofs one may find *Onygena equina*, a stipitate Ascomycete producing a powdery head of spores. *O. corvina* may occur on rotting bird feathers or rotting fur. Cadavers of insects or spiders under soil, moss, or bark serve as substrates for various *Cordyceps* species.

**Dung:** Animal feces, particularly from herbivores, are rich sources of highly specialized macrofungi. The mycoflora on dung changes as the material ages. Fresh dung is often first covered by *Pilobolus*, but after that growth dies down many genera of cup fungi (e.g., *Ascobolus*, *Saccobolus*) arise followed by Basidiomycetes such as the agaric genera *Coprinus*, *Psathyrella*, *Psilocybe*, *Stropharia*, and *Anellaria*, the occasional stinkhorn (*Anthurus*) and bird's nest fungi (*Cyathus*). Some species show a preference for different types of dung, i.e., horse versus cattle versus deer or moose. Even rabbit and mouse dung have their own mycoflora.

**Underwater:** An array of macrofungi exists that has evolved mechanisms for colonizing submerged or periodically submerged plant litter and wood. In moderately fast flowing streams *Vibrissea truncorum* will grow on submerged wood, while *Cudoniella* species grow on submerged leaf and woody litter in stagnant water. *Mitrula* grows in still water in bogs, forest pools, and ephemeral ponds. Many smaller mushrooms in the genera *Mycena*, *Resinomyces*, *Hemimycena*, *Coprinus*, and *Marasmius* occur on sedges, rushes, cattails, and grasses that may be submerged annually. *Hypopholoma*, *Galerina*, *Stagnicola*, and *Mythicomycetes* all inhabit the bottoms of ephemeral forest pools, fruiting after they drain.

Source: *Standardized Inventory Methodologies for Components of British Columbia's Biodiversity: Macrofungi (including the phyla Ascomycota and Basidiomycota)*, January 1997.

# Spore Prints

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## PUGET SOUND MYCOLOGICAL SOCIETY

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## CALENDAR

- Apr. 7 Field Trip, 9 AM – noon, MacDonald Park, Carnation  
Dye Workshop, 1 PM, MacDonald Park, Carnation
- Apr. 10 Membership Meeting, 7:30 PM, CUH
- Apr. 12 Beginner's Class, 7:00 PM, Douglas Classroom, CUH
- Apr. 16 Board Meeting, 7:30 PM, CUH
- Apr. 17 *Spore Prints* deadline
- Apr. 19 Intermediate ID workshop, 7:00 PM, Douglas Classroom, CUH
- Apr. 26 Intermediate ID workshop, 7:00 PM, Douglas Classroom, CUH
- May 3 Intermediate ID workshop, 7:00 PM, Douglas Classroom, CUH

## BOARD NEWS

**Molly Bernstein**

A \$600 honorarium was proposed and passed unanimously for Dr. Katie Glew, who taught five lichen classes and led one field trip this winter. Milton Tam was appointed to Vice President and Kevin Bernstein was appointed to fulfill the remainder of the trustee position vacated by Younghee Lee. The number of field trips has been changed to three in the spring and four in the fall, plus the joint PSMS/The Mountaineers field trip to Meany Hall. The winner of the Golden Mushroom Award was Lorraine Dod. The Board thanked outgoing members Tony Tschanz, Steve Haynack, Joanne Young, and Luis Felix for their contributions. New officers and board members to begin their terms in April are Vice President Milton Tam; Secretary Dennis Oliver; and Trustees Brenda Fong, Lynn Phillips, Molly Bernstein, Cynthia Nuzzi, Kim Traverse, and Kevin Bernstein (one year). There are no alternates.

## MEMBERSHIP MEETING

Tuesday, April 10, at 7:30 PM at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle.



Our April speaker is the inimitable Paul Kroeger. Paul's talk, called "*Fungi of Gwaii Haanas*," is an account of a fungal study of the Queen Charlotte archipelago and includes many general interest slides and some short film clips.

Long active in the Vancouver Mycological Society, Paul has served as their president, edited their newsletter, been their foray and exhibit chair, and chaired the North American Mycological Society's foray hosted by VMS at Whistler in 1990. He has worked as a mycological and botanical consultant for Canadian forestry projects, was a founder of the Meager Creek Wilderness Society, and is active in the Pacific Northwest Key Council. Listening to him is always a pleasure, and April's meeting should be a real treat.

Would persons with last names beginning with the letters A–K please bring refreshments for the social hour?

## ELECTION RESULTS

**Joanne Young**

We have what should be a wonderful new board. The new officers are

### **Dennis Oliver, Secretary**

### **Milton Tam, VP** (by appointment of the board)

Milton was newly elected to the board and then appointed Vice President at the March board meeting.

New board members with terms expiring in 2009 are

### **Molly Bernstein**

### **Brenda Fong**

### **Cynthia Nuzzi**

### **Lynn Phillips**

### **Kim Traverse**

Board members with terms expiring in 2008 are

### **Colleen Compton**

### **Marilyn Droege**

### **Jamie Notman**

### **Doug Ward**

**Kevin Bernstein** was appointed to serve the remainder of Younghee Lee's term which expires in 2008.

Members whose terms have ended are

Luis Felix

Steve Haynack

Carissa Thornack

Tony Tschanz

We had seven candidates and needed all of them for board positions, so there are no alternates. All candidates were popular, and each one received more than 50% of the votes cast.

**Derivation of the word "mushroom."** Various hypotheses: (1) from French "*mousseron*," generally considered to be from "*mousse*" (moss) because the species grow in moss or short grass or are soft. (2) from a combination of the Welsh/Old British "*maes*" (a field) and "*rhum*" (a thing that bulges out). (3) from the French "*mousche*" (from the Latin "*musca*"), a fly.

## SPRING FIELD TRIPS

Colleen Compton

In addition to the MacDonald Park field trip April 7, we are planning only two field trips this spring. The first is in the beautiful Teanaway River area. The second is at Coleman Leuthy's cabin on Eagle Creek north of Leavenworth.

May 12

**29 Pines Forest Camp**  
(elev. 2500 ft., 102 mi. east of Seattle)

Directions: Take I-90 over Snoqualmie Pass to exit # 85. Follow signs to Hwy. 970 and continue 4.5 miles. Turn left on Teanaway River Road. Proceed about 6 miles, bearing right at the fork onto the Teanaway North Fork Road. Continue another six miles just past the new fish hatchery on the left and Jack Creek. Twenty-nine Pines is located on the left. There is no shelter or water, but there are outhouses. Camping is free. You may wish to bring a potluck dish or goodies to share with other mushroomers. Plenty of firewood is nearby. Ron Post will host along with Lynn Elwell.

May 26–28

**Eagle Creek**  
(elev. 1800 ft.)

Coleman Leuthy and Brian Luther have again generously offered to let us use their property on Eagle Creek which is located 7 miles from Leavenworth. Directions: Take your favorite route to Leavenworth: (1) Hwy. 2 over Stevens Pass or (2) I-90 east to Cle Elum, then Hwy 97 north over Blewett Pass to Hwy. 2. Proceed west to Leavenworth. Coming from Stevens Pass, continue through town toward the east end. Before the Safeway, turn left (north) at the traffic light onto Chumstick Road (also called Chumstick Hwy.). Coming from Blewett Pass, drive past the Safeway and continue another ¼ mile or so to Chumstick Road on your right. Turn right and proceed another 2 miles (¼ mile past the railroad trestle), and turn right onto Eagle Creek Road. Follow the road for approximately 4⅓ miles. Look for an old barn with a dark red metal roof and several other buildings. Turn right at the PSMS signs. Emily Routledge will host. Camping, of course, is free. Look for further information in the next *Spore Prints* and on our Website.

## NOTES ON THE INGESTION OF AMANITA

### MUSCARIA

Lawrence Millman and Tonya Haff

*SOMA News*, February 2007



Boiled to remove its toxins, *Amanita muscaria* can usually be eaten with impunity. David Arora serves it on his forays; Russians call it *mukhumor* and delight in its nutty flavor; and the Japanese reputedly prefer it to *Boletus edulis*. Recently, Lawrence Millman and Tonya Haff had an experience of *A. muscaria* somewhat different from the purely culinary experience they intended to have.

Tonya cut two large (18 x 8 cm) *A. muscaria* buttons into ¼-in. strips and placed them in two quarts of boiling water. The mushrooms were cooked for 3½ minutes (they were actually in the boiling water for 5 minutes), and after they were drained, both of us sampled a few pieces. We found the taste pleasant, indeed agreeably nutty, although Lawrence thought they also had a slightly metallic aftertaste. We browned several more slices in olive oil and found them quite pleasant too. The remaining slices were breaded, and then browned. Altogether we ate almost all of the two buttons.

Twenty minutes later both of us started to feel distinctly “off.” Lawrence found himself staring vacantly at some LBMs we were trying to identify. Tonya noticed that he was holding his stomach and looking uncomfortable. Once we agreed that *A. muscaria* was the culprit, we called David Arora and asked him what we should do. “Take notes!” David said. So what follows are the notes we took during the experience.

18:56. We ate *A. muscaria* at 6:00 PM. Tonya was initially feeling hot, but now she’s feeling cold. Her sense of smell is heightened. Lawrence can’t seem to concentrate on identifying our mushrooms.

19:09. Tonya is slurring her words. Her pupils are dilated, and there’s a lump in her throat. She finds the cedar-like odor of *Camarophyllus russocoriaceus* quite cloying. Her upper lip is sweaty. Her stomach is mildly queasy, while Lawrence’s stomach is very queasy.

19:15. Tonya’s fingers are clammy. She says her arms are unusually goose bumpy. The cedar-like odor of the waxy cap is really bothering her now. Music is bothering her, too (“Bob Dylan driving me up a wall”). Lawrence retreats to the bathroom.

19:23. Having vomited up some of the *muscaria*, Lawrence says he feels a bit better. Or at least his stomach feels a bit better. The rest of him feels buzzed and more or less out of it. He also feels quite hot.

19:27. Tonya is experiencing a heightened sense of touch. Lawrence’s fingers on her forehead seem to be burning a cold hole in her. There’s an acute pain in her eye, but it soon goes away. Lawrence still has a slight buzz, very different, he says, from the experience of being drunk. He remarks that he’s glad he’s not a Siberian shaman. (Note: Siberian shamans eat *A. muscaria* for ritualistic purposes.)

19:38. Our “highs” seem to have stabilized. Lawrence is again trying to identify some of our mushrooms. Tonya says she feels almost normal, whereas Lawrence says he can’t feel normal because he isn’t.

19:53. Tonya is starting to feel a bit hungry. Lawrence’s head feels like foam.

20:00. Tonya feels dizzy when she rolls her eyes. Also sort of sleepy. Lawrence succeeds in identifying a *Mycena*.

20:30. Tonya’s feeling clumsy and poorly coordinated, but otherwise okay. Lawrence can’t seem to dial a friend’s phone number, and likewise can’t close the sliding door without getting his hand stuck in it. Also, he says the mushrooms we’re trying to I.D. are talking to him.

21:15. Lawrence has been silent for a while, listening to the mushrooms. All of a sudden he’s very talkative, although he’s not making much sense. “Smooth circus”—neither of us knows what that means. “Mushrooms are people, too,” he says.

21:29. Both of us feel euphoric, Lawrence especially so—he says he hasn’t felt this good in years. We decide to go out to dinner, but first we call David Arora to tell him that we’re all right. “Whatever you do,” David says, “don’t drive.” So we appoint Tonya’s roommate Mikey the designated driver.

21:54. At a Chinese restaurant. Tonya thinks our food has a consciousness of its own as well as a texture that’s “very real.” She also thinks everyone in the restaurant is high, and that Lawrence likes Republicans, although he’s earlier made it clear that he doesn’t.

cont. on page 4

### *Amanita Ingestion, cont. from page 3*

22:10. Both of us seem to be suffering from short-term memory loss. Lawrence feels that his critical sense, usually very much in evidence, has gone on vacation. The word “euphoria” keeps popping up in our conversation.

23:00. We leave the restaurant. Lawrence says that objects have no meaning, but simply exist. We see a dead deer on the road, and he says the difference between a dead deer and a living one is negligible. Tonya still feels elated, exuberant but at the same time relaxed. She falls asleep around midnight without any difficulty. For the next three days her right ring finger tingles when she hits it with her thumb, but otherwise she notices no symptoms relating to the *A. muscaria* ingestion. Lawrence has a deep sleep and wakes up the next morning feeling refreshed.

Later we asked David Arora why we experienced the ups and downs of an *A. muscaria* trip when all we’d wanted to do was experience the culinary delights of a *muscaria* hors d’oeuvre. His explanation: that the mushrooms were far too big for the pot in which they were boiled, with the result that only as much of the toxins were dissolved in the water as the water itself could hold. Thus our trips included a certain disarray of the senses, but not the full disarray experienced by Siberian shamans; and thus, too, our trips did not require a different sort of trip—i.e., to the hospital.

## COVETED, FRENCH, AND NOW IN TENNESSEE

Molly O’Neill

*The New York Times*, February 28, 2007

The town of Chuckey is located on the upside of the Nolichucky River valley in an eastern jut of Tennessee about 20 miles from the crest of the Blue Ridge Mountains and the North Carolina border. The East Tennessee and Virginia Railroad used to stop in the town to pick up grain and tobacco, but the red brick station, built in 1906, is long since abandoned. Many of the farms have given way to middle income housing and the workers among the town’s 800 or so residents tend to punch the clock at the Wal-Mart Distribution Center or in factories that make gift wrap, automotive parts, or lawn mowers.

Chuckey is not the sort of place one expects to find the holy grail of the food loving world. But on the edge of town, perched on a south-facing slope overlooking the birthplace of Davy Crockett, an orchard of 350 hazelnut trees has begun to sprout Périgord truffles, the fragrant black fungi that can send epicures, as well as routing pigs and dogs, into fits of frenzied greed.

The truffles from Chuckey are not the first American-grown Périgord truffles. They are, however, the first American-grown black truffles to excite some of the country’s top chefs, like Daniel Boulud, Thomas Keller, John Fleer, and Jonathan Waxman.

Although unexpected, the Tennessee truffles were not unplanned. Tom Michaels, a 59-year-old plant pathologist, pianist, and Scrabble tournament competitor, sprouted the hazelnut trees from seeds. He inoculated their roots with *Tuber melanosporum*, the Périgord truffle, before setting them in his backyard seven years ago.

He resisted dreams of a truffle bonanza as assiduously as he limed his soil and trimmed his trees. Dr. Michaels had, after all, grown up on a mushroom farm west of Chicago and had written his thesis on the difficulty of the *in vitro* cultivation and growth of *T. melanosporum*.

He knew that millions of dollars have been lost since the 1970s in the attempt to cultivate truffles in the United States. Some of the failures were spectacular. One multimillion dollar orchard in Hext, Texas, is now being managed as a game preserve.

When, on the morning of Jan. 3, he noticed patches of the tawny Tennessee soil bubbling up like blistered asphalt in his orchard, however, Dr. Michaels lost his circumspection. “I was jumping around yelling ‘Eureka!’ ” he said. And that was before he saw the size of the bulbs, before he felt them and smelled them and tasted them, before one of his truffles had found its way into the chef Daniel Boulud’s kitchen in Manhattan, before the chef had confirmed the grower’s suspicion.

“This is it,” Mr. Boulud said. “The first time in America. This Tennessee truffle is the real thing.”

Only then did Dr. Michaels realize that up to 150 pounds of world class truffles could be ripening in the ground behind his modest three-bedroom ranch, and that he had neither dog nor pig to sniff them out before they withered and disappeared.

“Growing truffles is not like growing tomatoes,” he said. “You don’t just plant them one day and know that a certain number of days later they will fruit.”

In fact, to grow truffles is to govern an intricate culture of plant and fungus life, as well as environmental conditions, not all of which are known and most of which are hidden underground.

Tending a truffle orchard is as much of an art as it is a science and it is, most of all, an act of faith—it typically takes 6 to 12 years for the fungi to form truffles in the earth. Mystery and scarcity are part of the truffle’s allure.

According to James M. Trappe, a professor emeritus of mycology at Oregon State University and the co-author of the forthcoming *Trees, Truffles and Beasts: How Forests Function* (Rutgers University Press), there are about 60 species of true truffles, the subterranean fungi that attach to a plant’s roots and issue long tendrils that gather nutrition for the plant and use the carbohydrates that the plant returns to eventually form the “fruit” we call truffles—but only a dozen are prized in the kitchen.

Most fungi sprout a stem and cap that contain reproductive spores. The truffle does not. The truffle is a “sack of spores,” explained Dr. Trappe, and while other mushrooms need nothing but a rustling wind to loosen and spread their seed, the subterranean bulb needs to be digested and excreted by an animal. In order to attract



*Truffles grown on Dr. Michaels’s orchard.  
This handful is worth about \$150.*



One of Dr. Michaels's truffle-producing orchards outside Limestone, Tenn.

rodents and marsupials, the truffle, like a tiny underground perfume factory, produces up to 50 different chemicals that combine to create a scent powerful enough to penetrate up to three feet of earth.

“Some smell like cheese, some like garlic, some like fruit, some like sewer gas,” Dr. Trappe said. The aroma of *T. melanosporum*, generally a mixture of musk and fruit and forest floor, and the earthy, garlicky aroma of *Tuber magnatum*, or Italian white truffle, are the most prized.

The Burgundy truffle, which thrives in a cooler climate and is currently being tested by Johann Brunn at the [University of Missouri](#), and the white Oregon truffle also have a pronounced aroma. The summer truffle and the pecan truffle from the American South are milder.

Truffles occur naturally, but the most prized ones have been disappearing since the late 19th century. By all accounts, current Périgord truffle production is only about 5 percent of what it was back then. Until recently, they resisted all attempts at controlled cultivation.

French scientists, Dr. Trappe said, patented a technique for inoculating the roots of traditional host trees—the hazelnut and three different varieties of oak—with truffle spores. The result was seedlings that could be planted in any hospitable soil. In the late 1970s, orchards were planted in northern California, and in 1980, Franklin Garland, a greenhouse owner from Hillsborough, N.C., bought some of the French-inoculated trees and planted them outside his hometown.

Meanwhile, at Oregon State University, Tom Michaels was completing his doctorate, running field trials of truffle cultivation research. Dr. Michaels worked in mushroom research for six years before starting his own button mushroom farm. He sold it in 1992 to follow his wife, a physician, to Tennessee, where she had accepted a position. He had intended to be Mr. Mom, he said, but his plans changed after he drove across the mountains to North Carolina's Piedmont district to visit Mr. Garland.

“He only had a couple truffles,” Dr. Michaels said. “He had significant ‘brûlé,’”—he circle of burned vegetation around the base of trees that is the classic signature of the presence of the truffle fungus. “As soon as I saw that, my truffle light went on.”

His doctoral research had demonstrated that truffles prefer warm, dry summers; cool, wet winters; and alkaline soil like that of east-

ern Tennessee. He knew that *T. melanosporum*'s natural enemies are the dozens of other fungi eager to colonize the roots of hazelnut or oak trees. The limestone soil in his backyard, he figured, was similar to the soil of the Périgord region, to which *T. melanosporum*—but not necessarily its competitors—had, over millennia, adapted. After several years of experimenting with different ground covers and fertilizers, he put in his first orchard in 2000. By this January, when his first crop appeared, Dr. Michaels had three separate plots of land with about 2,500 trees in cultivation.

Dr. Michaels is the first domestic truffle farmer to produce commercial quantities of truffles of a quality that commands top dollar (\$50 an ounce, \$800 a pound). But he is not the only one panning for black gold. There are, said Charles K. Lefevre, the owner of New World Truffieres in Eugene, Ore., about 300 promising orchards on American soil. “The same sort of people you find growing grapes in California are starting to plant truffle orchards,” said Dr. Lefevre, whose company last year supplied about 13,000 inoculated trees to about 50 hopeful growers.

In Hillsborough, Mr. Garland's nursery, Garland Truffles, supplies a similar quantity of inoculated trees. With a \$235,000 grant from the North Carolina Tobacco Trust Fund, which supports research that may benefit former tobacco farmers, Mr. Garland has also supplied 45 of those farmers with trees. If even a small number of these orchards succeed, truffles will be more plentiful and their prices may begin to drop.

But while the science of truffle cultivation has improved, the secret of coaxing Périgord truffles from the earth remains tucked in an unlikely corner.

“Take a right at the House of Hidden Treasures,” Dr. Michaels instructs visitors to Chuckey, “then follow that road past some mobile homes. I'm the last driveway on the right.”

## THE RETURN OF THE CUCKOO, OR MORELS IN TIBET

Daniel Winkler

One early morning in Riwoche, I was awoken out of deep sleep by a very intense and insistent call: coo-coooo, coo-coooo, coo-coooo. Right outside of my room, a mildewy government guestroom for visiting officials tucked into some former storage facility, a cuckoo was perched in a cottonwood. I recognized the call of the cuckoo right away as does every person that has heard it once in his lifetime. It transported me right away back into my childhood and my beloved Bavarian mountain forests. I was completely surprised to hear the cuckoo in Tibet, but then I remembered that there is a famous Tibetan Buddhist text from the 8<sup>th</sup> century I had read that is called “The call of the cuckoo.” But it is not just the cuckoo's call that makes this bird so unique. The cuckoo has developed a very interesting reproductive strategy. It is outsourcing the raising of its offspring. The mother lays her eggs in many nests of other singing birds, often a fraction the size of this pigeon-sized bird. I wouldn't wish any bird a cuckoo's egg in its nest. Once hatched, the cuckoo chick kicks out all other eggs or chicks, and within weeks outgrows his adopted parental unit that must feel really confused about the look of their murderous ugly duckling. The tiny parents hardly manage to keep the little monster fed; its open beak is much bigger than their whole head.

The night before, I came across heaps of fresh morels on bamboo mats and strings of morels that were hung for drying on Riwoche's

cont. on page 6

## Morels in Tibet, cont. from page 5

main street. The call of the cuckoo beautifully illustrated why Tibetans call morels *gugu shamo*, “the cuckoo mushroom.” I had known for years the name *gugu shamo*, but I had no clue where it came from. Just two days earlier I had learned its meaning. The morel is named after the cuckoo because of timing. Both morels and cuckoos return each spring around the same time.

In lower, warm valleys in Tibet this could be in May, but here in Riwoche, which is nestled between spruce covered mountains at 3800 m (11,800 ft), it is in June after the onset of the monsoon, the rainy season. Near Riwoche, morels are collected at least up to 4200 m (13,000 ft), where the tree line is nearly another 500 m (1650 ft) higher up. In low lying Tibetan areas, morels can occur down to 2500 m (7800 ft). While many root-associated mushrooms wait until July to fruit, morels shoot up soon after the first summer rains or warm spring rains.

For centuries Tibetans have collected and traded culinary and medicinal mushrooms. But only recently, after decades of government imposed quotas, which forced locals to collect prescribed amounts, and often paid ridiculously low prices, is collection back in the hands of rural people. Now a very vital mushroom trade thrives in Tibet. Foremost is yartsa gunbu, the caterpillar fungus (*Cordyceps sinensis*), but culinary mushrooms like the golden “sersha” (*Armillaria luteovirens*), “shadro” (*Sarcodon imbricatus* / *Hydnum imbricatum*), and “karsha” (*Agaricus campestris*) also have a long history. For export to China, the caterpillar fungus and wood ear (*Auricularia auricula*) had great traditional importance. However, the whole culinary fungal trade mushroomed like crazy once Japanese dealers realized that their beloved matsutake (*Tricholoma matsutake*) is being traded for cheap on markets in southwest China. Within a few years in the early 1990s, matsutake collection increased dramatically, and an export industry was created that managed to supply fresh mushrooms from absolutely remote rugged mountain valleys to urban Japanese consumers. This trade even brought electricity to remote villages in order to produce ice for cooling the matsutake on their way to the closest airport.

Morels do not need any sophisticated cooling, since they dry easily and are mostly traded dried. Still, the morel trade just hopped the running matsutake express, using its established lines of communication. In 1997 and 1998 I saw no trace of morel trade in Riwoche. Most Tibetans were not yet aware of the edibility, let alone delicacy, of morels: I have not found a single Tibetan who stated that morels were traditionally consumed in Tibet. Thus in the past, morels and Tibetans hardly mixed but by accident in the woods. When I returned eight years later for mushroom market research to Riwoche, several Chinese and Muslim run stores bought morels from local Tibetan collectors.

I was able to observe first hand how the morel trade established itself in the early years of 2000 in the Tibetan areas of Sichuan. I first came to Nyarong in 2001 to look for ways to help the forest bureau integrate local Tibetans into reforestation work and to introduce fruit tree growing, since logging was prohibited in 1998. The logging industry was in the hands of lowland Chinese who were brought in by the thousands and lived in their “China towns” somewhere in the middle of rural Tibet. Now, many of these Chinese workers were sent back home and the forest bureaus realized that they better cooperate with locals, because the Tibetans could be hired seasonally and for much less. In addition, the Tibetans loved the new grazing grounds that clear cuts offered their livestock, which was the major threat to reforestation.

To my complete surprise I came upon bags of dried morels at the forest department in Nyarong town, apparently some unofficial

sideline business. At this point I had already collected data on the caterpillar fungus and matsutake trade, but had not heard anything about morels in Tibet. I learned that in this remote county, far off from any paved road, not to mention railways or airports, morel buyers had shown up the first time in 1999, after morels were “discovered” in neighboring Kangding County, “only” a 10 hour drive away. The discoverers were mushroom buyers from Yunnan looking for new sources for morels. Once they had confirmed their assumption about morel presence, they talked to local mushroom dealers and encouraged them to spread the word that there was a precious fungus. They taught some of the dealers when and where to find morels and guaranteed them a price, so that they could offer collectors good money for their harvest.

Everything seemed to be going great until some cunning or upset collectors figured out how to insert stones into the hollow morels and thus increase their weight substantially; in other words, low moral values made high morel value. This did not fly well with the buyers and the market take-off came to an abrupt crash late in the 2000 season and nasty scenes followed. The Nyarongpas (people of Nyarong) had lost many buyers and the result was much lower prices. When I returned in 2002, the events of 2000 were still in everybody’s mind, but the 2001 season went well enough that Nyarongpas kept collecting and were hoping for more dealers to come by to drive prices back up. In 2002, for a metric pound of fresh morels collectors received ¥35 (US \$4.5), but I was told premium whitish morels (*Morchella esculenta* and relatives) would bring ¥60–70 (US \$6.5–8) per pound.

Several species of morels, such as *Morchella esculenta*, *Morchella elata*, and *Morchella conica*, are collected and traded, but regional fungal literature report no *Morchella angusticeps* and *Morchella crassipes*. Morel export industries have been mushrooming in the Himalayas (Pakistan, Nepal, Bhutan, and India) and in China since the 1990s. Naturally collection found its way up onto the Tibetan Plateau along the enormous river valleys that drain High Asia. The slopes of these deeply cut valleys and their less incised tributaries are covered by old-growth conifer forests. While the very humid forests around the edges of the Plateau have a dazzling array of forest tree species and depending to their altitude range from tropic to temperate, inside the Plateau in the core area of Tibetan civilization, biodiversity is reduced owing to a much colder and drier climate.

These temperate forests, with an annual precipitation of 500–800 mm (20–32 in.) are dominated by spruce, fir, and juniper species, but include broad-leaved trees such as aspen, willow, birch, and evergreen oaks. All in all these forests look not much different from forests in the Northern Cascades.

Morels strung for drying in Riwoche.



© Daniel Winkler



Mr. He, owner of a Sichuanese restaurant in Lunang / Lulang, showing off the morels he had stashed for his patrons.

Another time I ran into morels was in Nulang, Nyingchi County, a tiny roadside stop that had mushroomed because of its restaurants which specialized in serving locally grown and collected delicacies. I was just facing such a delight in the form of chicken feet floating atop the chicken-orchid root soup. I had heard about the orchid root for a week now. Luorong, a Tibetan co-researcher, was fascinated by the restaurant business that developed around the “palm-fungus” as he had called it. I was quite disappointed to find out that it was a starchy root and no fungus. Also, these well-clawed, black-skinned feet did not trigger any saliva production, but I knew I had morel and King Bolete dishes coming my way, so I was in the lucky situation that I could indulge in my culturally acquired food limitations. Mr. He, the Sichuanese innkeeper, had seen the glow in my eyes and the afterglow of the camera flash when he had brought the big strand of morels from storage to the kitchen. Once I had worn him out with my insatiable fungal curiosity he introduced me to Dorje, a Tibetan native to impoverished rural Shigatse, who spends most of his year here in Kongpo, making a slim but free living by hunting mushrooms and medicinals while avoiding close encounters with competing Himalayan black bears. He had tried his luck as a rickshaw driver for some years, but said the meager earnings from cycling around Chinese, Tibetans, and tourists through the exhaust in Lhasa left him literally hungry and sick.

Out here in the densely forested countryside, Dorje’s year is structured by the collection seasons. In May and June Dorje and his wife collect mostly mushrooms, “gugu shamo” (morels) and “yartsa gunbu” (caterpillar fungus), which provide most of their income. In July, “besha” (Matsutake) and boletes follow and at the same time “wangla” (*Gymnadenia*) collection commences. Wangla is the hand-shaped root of an orchid common in wet alpine meadows. It is used as a medicinal in Tibet, but Dorje collects it as a special ingredient to the famous local chicken soup. He also digs the tubers of another, much more precious medicinal orchid (*Gastrodia elata*) for the Chinese market, where it is known as “tianma,” “heavenly hemp.” At the end of summer “kanla metok” (*Saussurea medusa*) is collected high up in the mountains. In late fall, Dorje works at a lumber yard where he makes ¥12 (US \$1.5) per day loading timber trucks, the same amount he fetches for one nice specimen of yartsa gunbu he collects in May—which adds up to ¥30,000–80,000 (US \$3,750–10,000) per kilogram.

Morels do not fetch anywhere near like the elusive caterpillar fungus, but bring about ¥640–800 (US \$80–100) per kilogram for dried, whole specimens in the Tibetan hinterland. Down in Yunnan Province, to where most of the Tibetan morels are exported, a kilogram can fetch ¥1000–1200 (US \$125–150). Through the years the price for morels seems to be relative stable in Tibet. One buyer told me that the annual export from Yunnan to Europe is about 30,000 kg, but so far I cannot verify that. Figures and estimates I collected from several Tibetan counties indicate local production of 500–2000 kg per season, which would indicate a Tibetan Plateau harvest anywhere from 25,000 to 100,000 kg, but these are very rough guesstimates.

The center of the morel trade in Southwest China is Kunming in Yunnan, but there are also brokers in Chengdu, Sichuan. In Kunming and Chengdu, the morels are sorted according to quality for export to Europe. Most of the morels are destined for Germany and France, where for centuries morels have been collected and enjoyed as a delicacy. In Germany and France, so far no one has heard about the Tibetan name for the morel “gugu shamo,” but everyone has heard about the cuckoo. In Germany, little kids call “koo-kooook” when hiding to attract the searcher, just as American kids play peek-a-boo. How helpful it would be if the “cuckoo mushroom” would issue a similar call alerting the pot hunter to its hiding place. In French “coucou” is commonly used to denote a person as crazy. Hobby linguists with severe myco-vision, a condition fungo-fanatics are too often susceptible to, would suggest that the term “coucou” surely originates from the coincidental return of the cuckoo from its African winter quarters and the return of the morel initiating a new year of French fungal craze.

*In spring morels are sprouting in the woods on the Tibetan Plateau.*



Daniel Winkler started mushrooming at age four in the Bavarian Alps. He has a master degree in geography with emphasis on geobotany and ecology. He has worked as a researcher and Non-Government Organization consultant on environmental issues of the Tibetan Plateau and Himalayas for nearly 20 years. He has published on forest ecology, traditional land-use practices, medicinal plants, and, in recent years, mostly on economic fungi, especially *Cordyceps sinensis*. Daniel’s articles and photo essays are also published on his webpages [www.danielwinkler.com], where there is much more information posted on mushrooms in Tibet. He has been a PSMS member since 1996 and lives in Kirkland, WA USA. This mid-May and late July, Daniel is leading mushroom trips to Tibet (see webpages and March *Spore Prints*).

**LEMON LAMB STEW WITH MORELS** Tina Wistrom  
*SOMA News*, Sonoma Myco. Assoc., February 2007

Here is a tasty stew that I made with the morels won in the camp raffle! This family recipe is vaguely of Italian origin and I have not seen it anywhere else. It takes two evenings to make to allow the fat to be removed and flavors to mingle:

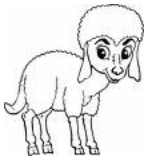
- 1½ lb lamb stew meat  
(more if it is very bony)
- 2 cloves garlic
- 1 TBs flour
- ¾ cup dried morels (or 1½ cups fresh crimini)
- Boiling water
- 2 cups stock (chicken, mushroom, or vegetable)
- 1 lemon, cut into thin slices circumferentially (rind and all)
- ¾ cup white wine

Pour boiling water over dried morels. When reconstituted, remove the morels and save the liquid. Brown lamb stew meat in a heavy skillet at medium heat. Sprinkle flour over lamb pieces, and add garlic and salt and pepper to taste.

When thoroughly browned, add the morel liquid and stock to cover the stew meat. Simmer for about an hour, covered. Remove from heat, and refrigerate overnight (longer is OK).

The next day, remove the fat from the lamb, and if you are really into it, remove the meat from the stew-bones. Sauté morels or crimini until thoroughly cooked. Add the stew meat and gravy to the mushrooms, as well as the white wine and lemon slices. Simmer until thoroughly reheated.

The recipe serves 4, over rice or orzo pasta or egg noodles.



**MEET LORRAINE DOD**

Inga Wilcox



The winner of this year's Gold Mushroom Award is Lorraine Dod. Californians have been migrating to the State of Washington for many decades. Lorraine and her husband came in the Fifties. They had met at the University of California at Berkeley; a job opportunity with Boeing

brought them to Seattle. Lorraine grew up in Oakland, not known for mushroom patches, and became interested in fungi while living here. She worked at the Boeing Credit Union, stayed home when her two children were born, but enjoyed hiking with The Mountaineers Club. One joint hike with PSMS introduced her to the many varieties of mushrooms growing here. And yes, the leader of that hike was none other than Coleman Leuthy. She joined the club and served as Secretary for six years. She likes to cook with mushrooms: morels, boletes and especially the Cauliflower Mushroom (*Sparassis crispa*) which she slices, then dries and freezes and serves floating in soups. One of her hobbies is knitting gloves and scarves which she contributes to various charities. Lorraine is now retired, enjoys her family, but is available to help out when needed.

*A courier arrived at JFK airport with white truffles. Upon his arrival a Homeland Security beagle sniffed something alarming. The courier was whisked into a back room, where the pricey truffles, along with some rare red mushrooms, were spilled out on a table. Asked their value, the courier, worried that if he said the actual amount they were worth he'd arouse suspicion, replied "\$300." The Customs officer was unimpressed. "You paid \$300 for that?" he said of the stinky load, and let him go.*

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