SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 438 January 2008

PSMS Holiday Cookie Bash & Art Show, 2007

Above & left: First place winner, art contest.

Did everyone get enough to eat?

PRESIDENT'S MESSAGE

Patrice Benson

Happy New Year! I am looking forward to the many mycological things coming up in 2008. First, I would like to announce that the recipient of the 2007 Ben Woo Grant is our own Joshua Birkebak. Josh is conducting an undergraduate project studying the lepiotoid fungi. The only other person working on this genus in the PNW is Dick Sieger. We will hear more about this from Josh later in the year.

I am sorry to say that founding PSMS president Ben Woo suffered a stroke in France and is recovering there. I do not have any further news of his condition at the time this article goes to press.

Nominations are under way for President, Treasurer, and five trustees. If you wish to nominate yourself or someone else (with their permission) please contact Dennis Oliver, Lynn Phillips, or Joanne Young. Nominations can also be made from the floor at the next membership meeting on January 8.

Our Annual Meeting and Survivor's Banquet will be held on March 7, 2008, at South Seattle Community College. More details about time and location will be on the website and in this and the next *Spore Prints* bulletin.

A large portion of our annual income is produced by book sales and the annual exhibit. In order to remain fiscally productive, two or three volunteers are needed immediately.

First, *co-book chairs are desperately needed*. There are a few members willing to help with book sales, but co-chairs are needed to organize this important task. Please call me if you are interested in spending club money to buy fun and interesting mushroom books to resell to our members and help fund our many activities and speakers.

Second, our exhibit will need a chair in the next 2 months, or there will not be an exhibit in 2008. Please step forward to direct our eager volunteers; the rooms are reserved and things are ready to go. You will have expert advice from Ron Post, past show chair and director of our most fun ever exhibit in 2007.

On a lighter note, Milton Tam, our VP, has arranged for a field trip to mushroom grower Ostrom's on April 6. This field trip will be limited to 40 people. More details in the next bulletin and on the website.

Thanks a million to Molly Bernstein for keeping our website beautiful and up to date.

Another unsung volunteer is our treasurer John Goldman. John steadily keeps our finances in order, pays our bills, manages the investments, and reports to the board each month with a detailed account of our banking, income, and expenses. Our most recent board meeting discussed the results of the annual exhibit. Our net was roughly $7000 after paying all expenses. This income and the income from book sales enables us to keep the membership fees affordable, funds this newsletter, and pays our insurance.

So, how about volunteering to make friends by helping with essential PSMS activities!

Call Patrice at 206–819–4842 and help make this another year to remember!

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Annual dues $25; full-time students $15

CALENDAR

Jan. 8	Membership Meeting, 7:30 PM, CUH
Jan. 14	Board Meeting, 7:30 PM, CUH
Jan. 22	*Spore Prints* deadline
Feb. 12	Membership Meeting, 7:30 PM, CUH
Mar. 7	Survivor's Banquet, SSCC

BOARD NEWS

Dennis Oliver

After a period of absence, your humble scribe has returned to report the discussions and decisions of the PSMS board.

John Goldman, our able treasurer, reported that the mushroom show was financially successful, garnering nearly $7000 over expenses; 93 new members joined PSMS, and over 1,375 people attended. Congratulation and thanks to all who contributed to this important endeavor

Josh Birkebak applied for and was awarded a Ben Woo Grant to study *Lepiota*.

The 2008 survivors' banquet will be held Friday, March 7, in the banquet room at South Seattle Community College.

The election committee is looking for just a few more candidates to serve on the board of trustees (see related article on page 3 of this issue). The club is also seeking members who are interested in filling two key positions: (1) chair or co-chairs for book sales and (2) chair for the annual exhibit. Both positions are great opportunities to become involved in the society. Contact Patrice Benson (206–819–4842) for more information.

MEMBERSHIP MEETING

Tuesday, January 8, 2008 at 7:30 PM at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle


Steve Trudell

Our speaker this month is Dr. Steve Trudell, who will be speaking on "Diversity of the Mushroom World." No one really knows how many different species of mushrooms exist in the Pacific Northwest or elsewhere. What is known is that there are LOTS of different ones. So how come? Again, there are no firm answers, but there are ideas. Please join us for an off-season look at the beautiful organisms we call mushrooms, and some of the reasons we think they are so diverse.

Steve is an affiliate professor in the College of Forest Resources and a part-time lecturer in the Department of Biology at the University of Washington. He earned his Ph.D. from the UW's College of Forestry Sciences where his dissertation research explored the use of stable isotope signatures to study the roles of ectomycorrhizal and saprotrophic fungi in nitrogen and carbon cycling in old-growth forests of the Olympic Peninsula. Steve has served as vice president of the North American Mycological Association and was president of the Pacific Northwest Key Council. He enjoys photographing and identifying mushrooms and studies their roles in forest nutrient cycling. His interests include the reasons behind and controls on fungal biodiversity. Ultimately he would like to know why there are so many different mushrooms, what are they all doing, and how they all fit in the ecosystem.

Would people with last names beginning with the letters L–Z please bring a plate of refreshments for the meeting.

STUNTZ FOUNDATION

Patrice Benson

The Stuntz Foundation has received a matching challenge from the Peg and Rick Young Foundation.

In order to fund our expenses for Mushroom Maynia at the Burke Museum on May 4, 2008, we sought grants through the Stuntz Foundation and through Joanne Young, who heads the Peg and Rick Young Foundation. The matching grant was proposed by the Peg and Rick Young Foundation in the amount of $2000 to fund this event.

We have collected more than half of the amount need to match the $2000 but need your help to match the rest. This grant will match donations, dollar for dollar, up to $2000 for the Mushroom Maynia at the Burke event. The Stuntz foundation is the sponsor receiving the donations and is a 501c3 organization, making your donations tax deductible.

The Stuntz foundation has a website (http://www.stuntzfoundation.org/)where you can find out more details about the foundation You can mail your donations to

Daniel E. Stuntz Memorial Foundation
6518 Woodlawn Ave. N
Seattle WA 98103-5428

CANDIDATES NEEDED FOR UPCOMING ELECTION

Dennis Oliver

Most people this time of year are thinking of the holidays like Christmas or Festivus. A few forward thinkers are thinking of snow that necessary prelude to snow bank fungi in the spring. But for four people—Ron Post, Lynn Phillips, Joanne Young and Dennis Oliver—elections are on our minds. We are looking for just a few more people to embark on the journey of learning and growth which is service on the board of trustees of PSMS. Requirements for serving on the board are enthusiasm for mushrooms and mushroomers and the willingness to help PSMS grow by serving its membership and the public. If you are interested in running for the board or would like more information, contact Dennis Oliver (oliverdm@msn.com) or any other member of the election committee. Serving on the board is fun, rewarding, and educational and does not require any heavy lifting.

THE RETURN OF THE CUCKOO, OR MORELS IN TIBET

Daniel Winkler
MushRoaming.com

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 8th century I had read that is called *The Cuckoo Call of the State of Awareness*. But it is not just the cuckoo's call that makes this bird unique. The cuckoo has developed a very interesting reproductive strategy: outsourcing the raising of its offspring. The mother lays her eggs in the nests of other singing birds, often a fraction 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 parents which 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 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 from a mycophile forester. The morel is named after the cuckoo since both appear in spring. In lower, warm valleys in Tibet, spring, and the arrival of morels and cuckoos, could be in late March, but in Riwoche—nestled between spruce-covered mountains at 3800 m (12,500 ft)—spring doesn't really arrive until May. Near Riwoche, morels are collected at least up to 4000 m (13,000 ft), nearly 500 m (1650 ft) below the treeline. Morels also occur down to 2500 m (8200 ft), which is about as low as it gets in Tibet.

The cuckoo as a messenger of spring is common knowledge in Tibet. As Namkhai Norbu writes,[1] "When the cuckoo sings everybody is happy because finally the ice and snow of winter are beginning to melt. Spring arrives and plants begin to grow. Poor thin animals like yaks and horses which had very little to eat in the snow are now certain that they will not die. Tibetans who have not heard the cuckoo will go to the mountains to look for one. It has to do with the Tibetan psychology. … Surely it is not the voice of the cuckoo that serves the medical purpose."

As a messenger of spring the cuckoo is also regarded as a bringer of amorous yearnings, as in this famous poem by to the Sixth Dalai Lama, who was not an ordained monk:

The cuckoo returns
From the land of Mon
Bringing rains for the dry fields.
Having now met my beloved
I relax in bliss and tranquility.

Also, the cuckoo is regarded as a divine and royal bird and magical powers were attributed to it. In a famous Tibetan parable, the cuckoo appears as a manifestation of Avalokiteshvara, the Buddha of compassion, teaching an assembly of all birds of Tibet. All this clearly demonstrates that Vairochana, the author of this 8th century text did probably not think of succulent morels floating in thukpa soup when he composed *The Cuckoo Call of the State of Awareness*.

For centuries Tibetans have collected and traded culinary and medicinal mushrooms. However, during the 1960s to the mid 1980s the Chinese government imposed quotas, which forced locals to collect prescribed amounts, and often paid ridiculously low prices taking away incentives to engage in the trade. In the late 1980s, the mushroom trade was fully back in the hands of rural people, and the export to the Chinese lowlands increased. In the 1990s, the global market found its way up to the Tibetan Plateau, offering lucrative prices for a few selected species.

Now a very vital mushroom trade thrives in Tibet. Foremost to mention is yartsa gunbu, the caterpillar fungus (*Cordyceps sinensis*), but also culinary mushrooms like the golden "sersha" (*Floccularia luteovirens,* formerly *Armillaria*), "shadro" (*Sarcodon imbricatus*), "karsha" (*Agaricus campestris*), and "shi gong" (*Amanita hemibapha*) have a long history. For export to China, the caterpillar fungus and wood ears (*Auricularia* spp.)

D. Winkler

Riwoche forest pasture.

cont. on page 4

Tibet, *cont. from page 3*

had great traditional importance. However, the whole culinary fungal trade mushroomed like crazy once Japanese dealers realized that their beloved matsutake (*Tricholoma matsutake*, known in Tibet as "besha," oak mushroom) was being traded for cheap on markets in East Tibet and 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 next airport.

Morels do not need any sophisticated cooling, since they dry easily and are mostly traded dried. 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. In Riwoche as in most areas of Kham, as Tibetans know the East of Tibet, which is currently administrated by Sichuan and Yunnan, I have not found a single Tibetan who stated that morels were traditionally consumed. In the past, morels and Khampa Tibetans hardly mixed but by accident in the woods. When I returned to Riwoche 8 years later for mushroom market research, 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 this millennia in the Tibetan areas of Sichuan. I first came to Nyarong in 2001 to look for ways to help the forest bureau to 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 had been sent back home, and the forest bureaus realized that they had 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 clearcuts 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 where "discovered" in neighboring Kangding County, "only" a 10 hour dirt road drive away. The discoverers were mushroom buyers from Yunnan Province 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 this 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 first harvest.

Everything seemed 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—the market takeoff 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, collectors received ¥35 (US $4.5) for a metric pound of fresh black morels, *Morchella elata* group and *M. conica* (in 2007 I was told ¥38), but I heard that premium whitish morels (*Morchella esculenta* and relatives) would fetch ¥60–70 (US $6.50–8.00) per pound.

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 according to their altitude reach from tropic to temperate, inside the Plateau in the core area of Tibetan civilization, biodiversity is reduced due 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 broad-leaved trees such as aspen, willow, birch, and evergreen oaks also occur. All in all, these forests don't look much different from conifer-dominated mountain forests in Washington State, North America, or Euroasia.

D. Winkler

Bonpo

Having been told by Khampa Tibetans that morels were traditionally not known to be edible, I was completely surprised when Bonpo, a father of nine children in Kadak village, Pome County, in Kongpo (currently Nyingchi Prefecture, Tibet AR), told me that already his great grandparents knew of the delicacy of cooked morels and collected them way before the Chinese takeover in the 1950s. Looking back, I realize I should not have been that surprised to find out that traditional mushroom knowledge has a distinct local character. Since Kongpo has some of the warmest and lowest-laying valleys in Tibet, locals collect gugu shamo in March and April. Bonpo collects his morels in grassy sites around a range of different trees. During a normal day he finds about a pound, but some days up to five or six pounds, of fresh gugu shamo. All in all Bonpo might find with the help of one or two of his kids 50–200 pounds per season, which shrivel down to 5–20 pounds when dried out, netting his household ¥1750–7000 a year. The cash made from morel hunting in addition to money made from matsutake hunting enabled Bonpo to buy a truck, which he now uses for all kinds of transport jobs when he is not collecting mushrooms

Another time I ran into morels was in Nulang, Nyingchi County, a tiny roadside stop that had mushroomed owing to its restaurants, which specialized in serving locally grown and collected delicacies. I was just facing such a delight in form of black-skinned 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-mushroom" as it was called by the newly settled Sichuan Chinese. I was quite disappointed to find out that in reality it was a bogus fungus, since this starchy root belonged to an orchid. Although these well-clawed, black-skinned feet did not trigger any saliva production, I knew I had morel and king bolete dishes coming my way, so I was able to indulge

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 from 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)—that 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 "dungpo," 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," the snow lotus (*Saussurea medusa*), a compositae displaying a fractally structured downy inflorescence, is collected high up in the alpine zone. In late fall, Dorje works at a lumber yard where he makes ¥12 (US $1.50) per day loading timber trucks, the same amount he fetches for one excellent specimen of yartsa gunbu he collects in May [which adds up to a price of ¥30,000–80,000 (US $3,750–10,000) per kilogram].

Morels do not fetch anywhere near as much as the elusive caterpillar fungus: about ¥600–800 (US $80–112) per kilogram for dried whole specimens in the Tibetan hinterland. Down in Yunnan Province, where so far most of the Tibetan morels have been exported to, a kilogram can fetch ¥1200–1500 (US $160–200). At the vegetable market in Kunming, Yunnan's capital, small amounts were sold for a kilogram equivalent of ¥2500 (US $330) in July 2007. Overall, the price for morels seems to be relative stable in Tibet through the years. One buyer told me that the annual export from Yunnan to Europe is about 30,000 kg, but I could not 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 25,000–100,000 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 the Chinese market or export to Europe. I just learned from my friend Todd Stagarno that French buyers started to buy directly from Tibetans in Barkam, Aba Tibetan Autonomous Prefecture, in Sichuan to cut out Kunming dealers. Most of the morels are destined for Germany and France, where for centuries morels have been collected and enjoyed as a delicacy.

Fresh morel, March 2007

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 "kookoook" 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 as in English "coucou" is commonly used to denote a person as crazy. Hobby linguists with severe mycovision, 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 the new year's morel craze.

[1]Namkhai Norbu 1990. Rigbai Kujug, The Six Vajra Verse. An Oral Commentary by Namkhai Norbu Rinpoche, edited by Cheh-Ngee Goh, Singapore.

Daniel Winkler started mushrooming at age four. He has a Master's degree in geography with emphasis on geobotany and ecology. He has worked as a researcher and Non Govermental 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 and elsewhere. Daniel is also leading mushroom trips to Tibet (www.MushRoaming.com), including a hunt for caterpillar fungus and morels in late May 2008.*

SCOTLAND'S WILDLIFE WATCH NOW INCLUDES FUNGI

Anne Marie Smout

summarized from *The Scotsman*, December 10, 2007

Last September's Wildlife Watch in Scotland differed in a surprising way from previous ones.

When analyzing the submissions, it became apparent that for the first time the number of botanical species recorded—comprising 40 flowering plants, 13 trees, and an astonishing 149 fungi—greatly outnumbered those of birds (99) and mammals (19). This achievement was mainly due to a few dedicated observers, who obviously felt that the balance needed to be put right, but far more submissions notably included records of wildlife other than birds. In addition to the above, there were six amphibians and reptiles, 29 insects, 11 mollusks, and one spider.

All macrofungi have now been given common names and, whereas names like dryad's saddle, inkcap, fly agaric, horse mushroom, and stinkhorn are well known, others are less familiar, such as humpback brittlegill or soapy knight. The lists submitted also included rusts, mildews, and a couple of the amazing slime molds.

DUES ARE DUE!

It's time to renew memberships in PSMS. *Unless you obtained or renewed your membership at or after the Annual Exhibit in October,* it officially ends December 31, 2007.

To renew your membership, send your dues *now* to

Bernice Velategui, PSMS Membership Chair
2929 76th Ave. SE, #504
Mercer Island, WA 98040

Annual dues are $25 for single or family memberships or $15 for full-time students.

ANCIENT CARNIVOROUS FUNGUS FOUND TRAPPED IN AMBER

James Owen

National Geographic News, December 13, 2007

A nematode worm discovered in an ancient lump of amber may have been the prey of a carnivorous fungus with which it was found, scientists say.

An ancient flesh-eating fungus that preyed on tiny animals has been found preserved inside a hundred-million-year-old lump of amber, scientists report. This unlikely fossil predator from the dinosaur era may represent the oldest known carnivorous fungus, according to German researchers.

The amber, from a quarry in southwestern France, also contained worms called nematodes, which the fungus snared in sticky loops before devouring them, according to a team led by Alexander Schmidt of the Berlin Museum of Natural History.

Modern day carnivorous fungi are known to use constricting rings, adhesive knobs, and similar projections to catch prey, but scientists are unsure when such devices evolved.

The new find suggests these micropredators had already developed complex trapping devices by the early Cretaceous period, which began 145 million years ago, the team reports in the latest issue of the journal *Science*.

The fungus was found in a single piece of amber dug up from a deposit near Les-Nouillers in southwestern France, and kept at the National Museum of Natural History in Paris.

Amber, a fossilized tree resin, often preserved prehistoric plant material and creatures that were caught up in the oozy substance before it hardened. The study specimen harbored various bugs and other organisms that indicated the resin had solidified in soil, where carnivorous fungi live.

Trapping Rings

The fossil fungus has branched projections called hyphae that are equipped with small rings.

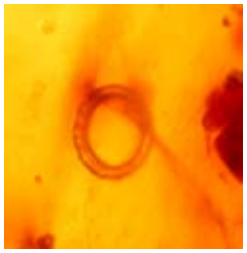
These rings are coated with tiny particles, which suggests they produced a sticky secretion used to trap several nematodes that were preserved close to them, the study team said.

The diameter of the microscopic worms matched that of the fungus' rings, the team also noted.

"Because their maximum diameter falls within the width range of the rings, these animals can be identified as potential prey of the fungus," the authors wrote.

"Once trapped, the nematodes were probably penetrated and digested by infestation hyphae," they added. While the rings resemble those found in modern trapping fungi, "the fossils cannot be assigned to any recent carnivorous fungus."

Nematode-eating fungi expert Philip Jacobs, based in Germany, described the study as "a really amazing report."



Science/AAAS

Hyphal ring encased in amber.

Bud Growths

Jacobs noted that the fossil fungus also shows evidence of buds known as blastospores, which are not seen in modern nematode-preying species.

And while none of the nematodes are seen actually inside the trapping rings, "it seems very probable that [the rings] were indeed capturing organs," Jacobs said.

However, George L. Barron, of the Department of Environmental Biology at the University of Guelph, Canada, is more skeptical of the amber findings. "The presence of nematodes could be coincidental and nothing to do with predation," Barron said in an e-mail. "Nematodes are commonly found mixed up within organic debris with nonpredatory fungal hyphae."

Barron said the rings of the fungus "are nicely shaped, and it is very tempting to suggest their function as primitive trapping devices," but he added that such features represent "a giant step on the evolutionary scale."

National Geographic news

"Someday someone might find the definitive proof in amber, showing a nematode captured in a ring, or a nematode by itself with a ring encircling its body," he added.

Nematode found near mushroom encased in amber.

WHAT LIES BENEATH: A NEW MUSHROOM

Paul Fattig

Mail Tribune, November 20, 2007

Shady Cove, Ore. - Hydrologist Robert Coffan knew he was looking at something very unusual in the knee-deep summer waters of the upper Rogue River.

Here were gilled mushrooms, swaying in the main current of the clear, cold river in early July through late September.

"But since gilled mushrooms DO NOT live and grow underwater, I was real nervous" about approaching a mycological expert, admitted the adjunct professor at Southern Oregon University (SOU).

Indeed, Darlene Southworth, a retired SOU biology professor, was plenty skeptical when he broached the subject. Although she was impressed by underwater photographs taken by Coffan, she wanted to see the evidence firsthand. Not only did she witness the mushrooms found by Coffan, but she discovered others during an August visit to a stretch of the north fork of the river within a few miles of Woodruff Bridge in the Rogue River-Siskiyou National Forest.

"There are no known gilled mushrooms living underwater," Southworth explained. "And this is not a slime mold or anything like that. These are regular gilled mushrooms. We believe this is a new species," she concluded of the mushrooms, which are typically about 10 cm tall with caps that are about 2 cm wide.

The find was unveiled Monday night at the November meeting of the Upper Rogue Watershed Association, for whom Coffan had prepared a water assessment last year.

Dubbed *Psathyrella aquatic*, the mushroom is being introduced to the broader scientific community in a 14-page paper submitted November 9 to the science journal *Mycologia*. The paper was written by Coffan in collaboration with Southworth and Jonathan Frank, a laboratory technician at SOU.

A new species of mushroom, dubbed Psathyrella aquatic*, has been discovered in the upper Rogue River. Biologists believe this is the first gilled mushroom to be found living underwater in the world. The bubbles on the top of the mushroom are caused by an unknown gas.*

Coffan credits Southworth, who now conducts research under a National Science Foundation grant at the university, for focusing on mycorrhizal fungi, and Frank for the paper and much of the research in determining the mushroom's uniqueness.

Up at Oregon State University, Matt Trappe, a doctoral candidate in forest mycology, says Coffan has found a unique mushroom. He and his father, Jim Trappe, a retired U.S. Forest Service mycologist who now teaches in OSU's botany and plant pathology department, were consulted on the find.

"As far as we've determined, this is a first in Oregon as well as a first in the world," Matt Trappe said of gilled mushrooms living in water. "We're not aware of anything at all like this in mycology where the reproductive mushroom structure appears to be perennially underwater. If this evolved in Oregon, what are the odds it can be found in streams and rivers around the world?" he asked. "This raises all kinds of questions about spore disbursement and evolution."

There are more questions than answers at this point, acknowledged Coffan, who originally discovered the water-dwelling gilled mushrooms in summer 2005. None of the mushrooms were found in slack water, he noted.

A DNA analysis at SOU's Biotechnology Center and a cross-check of references and experts, including mycologists at the University of Minnesota, determined the mushrooms belonged to the genus *Psathyrella*, Southworth said. Samples were sent to OSU and to San Francisco State University.

There are about 600 known species of *Psathyrella*, all terrestrial, she said.

"How do we identify them? We look at the morphology—the form, the shape, and the DNA," she said.

Psathyrella aquatic has a small bell-shaped cap, a thin stipe (stem) and gills underneath, she said. They examined the cells in the cap and made a spore print.

Researchers have ruled out the possibility the mushrooms were growing along the banks and were merely submerged by rising waters brought on by snow melt. The mushrooms were found in the spring-fed "base" flow of the river, Coffan said, noting that flow is consistent and keeps the mushrooms submerged.

The mushrooms tend to grow on submerged wood but can also be found growing in the gravel, Southworth said. "These are growing in the same place for three months," adding they have been found as late as September 21.

Although there are some known freshwater aquatic fungi, this is the only known gilled mushroom that grows underwater, she reiterated.

"We noticed there is a gas bubble underwater," she said. "When we pulled the mushroom out, we could hold it up for some seconds before the spores burst. But they would not be uniformly distributed. They would stick to the cap, to the stipe, to Jonathan's fingers." They don't know what the gas is, she noted.

They are also intrigued by its three-month fruiting season. "That's way long for mushrooms," she observed.

As for their edibility, Southworth figures the waterborne mushrooms are too small to warrant collecting for food. However, several of the terrestrial *Psathyrella* are edible, although most have never been tested as a food source, according to her research. "There is no reason it would go toxic," she observed of a member of the genus growing in water.

Meanwhile, Coffan, Southworth, and Frank plan to return to the area to conduct further research to try to determine the extent of the mushroom's habitat. They also want to check out other streams in the region for evidence of the mushrooms.

"But it will be next summer before that is feasible," she said. "Right now we can describe this one river: It's aerated, cold, clear, steady flow. But we want to find out how the spores are dispersed."

"And we want to find out how unique the habitat is," Coffan said. "We have a whole new area to look for mushrooms now. It's mind-boggling."

Robert Coffan

Psathyrella aquatic.

PILOT LANDS COPTER TO PICK MOM MUSHROOMS

Seattle PI
November 16, 2007

(AP) Bangkok, Thailand - A Thai Air Force pilot has been suspended from flying duties after allegedly landing his helicopter in the countryside to collect wild mushrooms for his mother, a spokesman said Friday.

The Air Force ordered the provisional suspension and began investigating after villagers in the western province of Kanchanaburi reported the incident to police, said spokesman Capt. Monthon Satchukorn.

Monthon said villagers said that a helicopter had circled a jungle clearing Wednesday before landing, and when some of them went to investigate, they found that the pilot had gone.

When the pilot eventually returned, he told them he had been collecting mushrooms for his mother.

"The pilot will face punishment for abandoning his helicopter without anyone to look after it and also for violating other rules," Monthon said.

SAVE THE DATE!

MARCH 7, 2008 - SURVIVORS BANQUET

(Time to be determined)

This year our Survivors Banquet will be at
South Seattle Community College

PSMS member Chef Michael Blackwell will direct the kitchen for our banquet; mushroom inspired!

Cost: $35
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RESERVE YOUR PLACE!

Participation is by reservation only
Deadline is March 1st

Send a check with your name
(or names if you come with a guest)
and food preference, if vegetarian, to

Cynthia NUZZI
9323 SE 43rd St.,
Mercer Island, WA 98040

We need donations of dried boletus and morels.

Please bring them to the January or February membership meeting.

If you need to drop your donation off at another time, or if you have frozen mushrooms to donate, call 206–722–0691 or e-mail Patrice Benson, patrice.benson@comcast.net

More details in the next *Spore Prints*

FUNGUS ONCE AGAIN THREATENS FRENCH CAVE PAINTINGS

Marlise Simons

The New York Times, **December 9, 2007**

Paris, Dec. 8 - For the second time in a decade, fungus is threatening France's most celebrated prehistoric paintings, the mysterious animal images that line the Lascaux cave in the Dordogne region of southwest France, scientists say.

No consensus has emerged among experts over whether the invading patches of gray and black mold are the result of climate change, a defective temperature control system, the light used by researcher, or the carbon dioxide exhaled by visitors.

But after inspection by a team of microbiologists, the government has approved a new treatment of the blemishes with a fungicide and ordered that the cave be sealed off for as long as four months so that its delicate environment can be stabilized.

MONGREL FINDS RECORD-BREAKING TRUFFLE

Tom Kington

The Guardian, Monday, November 26, 2007

A mongrel dog named Rocco helped make history in a Tuscan wood when he led his owners to a 1.5 kg (3.3 lb) white truffle. "I had to tie Rocco up, he was so excited," said truffle hunter and trader Cristiano Savini, who spent more than an hour on his hands and his knees with his father, Luciano, carefully digging down 80 cm (2.6 ft) to find the truffle at a secret countryside spot near Pisa.

The largest unearthed in half a century, the knobby, soil encrusted truffle sold for $330,000 at a charity auction held simultaneously in Macau, London, and Florence. Savini said he was happy to see it all go to charity. "This truffle was a gift from God," he explained. Rocco the dog, however, will be rewarded with a new kennel.

Have a Happy New Year!

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