SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 429 February 2007

SURVIVORS' BANQUET

Jamie Notman

It has been a cold, snowy, windy and wet winter, and I for one want to see the sunshine once again. Since the weather is not warm, we can at least think warm thoughts, act like it's warm, and eat like it's warm.

With that in mind, we decided to have a picnic in the spring, inside. That's right. The food theme for this year's Survivors' Banquet on *Saturday, March 10*, is summer picnic potluck. So mark the date on your calendar, fire up the barbecue, and show us what you got! And don't forget the side dishes.

The social hour begins at 6:30 PM, with dinner at 7:30 PM. We only have seating for 100 folks, so everyone who is planning on attending needs to make reservations. It's going to cost $5 for everyone over 12 years old. You can make your reservation and pay at the meeting in February or you can send your payment to me at

J. R. Notman
5019 1st st Ave. N. E.
Seattle WA 98105.

At the meeting I will be setting in the back of the room taking reservations.

We will obtain a liquor permit so we can drink, and I have many other surprises and fun planned for the evening—an event not to miss.

RESEARCHERS BARCODE DNA OF 6000 FUNGI SPECIES IN VENICE MUSEUM

Sarah Yang

The Spore Print, L.A. Myco. Soc., January 2007

Berkeley, CA - In the storerooms of a Venice, Italy, museum, a University of California, Berkeley, scholar and Italian experts are at work on a rare collection, but the objects aren't Renaissance paintings or the art of ancient glassblowers. Instead, the team is collecting samples from the largest and best preserved collection of fungi in Italy to create an unprecedented DNA database.

These 28,000 samples of fungi that represent 6,000 species—many of which are quite rare—are housed at the Venice Museum of Natural History, a partner with UC Berkeley for this ambitious project. The collection also is one of the largest in Europe.

The project was publicly announced in Italy Wednesday, December 13, at the prestigious Venetian Institute of Sciences, Letters and Arts.

"We are building up a huge molecular database that will be available to the entire scientific community," said Matteo Garbelotto, UC Berkeley adjunct associate professor of ecosystem sciences and principal investigator of the project. "In addition to aiding research on the productivity of forests and agricultural ecosystems, this database will greatly aid the diagnosis of plant diseases."

Fungi are a kingdom of organisms that include yeasts, mushrooms, and mold. They are essential to most terrestrial ecosystems, channeling nutrients in the soil and making them available for the growth of plants, including trees and agricultural crops. "Without fungi, there would be no forests," Garbelotto pointed out.

A large number of fungi are also plant pathogens and cause serious diseases of crops and trees, especially when transported to new areas of the world through the global trade of goods and movement of people. In addition, some species of fungi can lead to human illness, including pneumonia, skin infections, allergies, and asthma.

Garbelotto is perhaps best known for his work in the identification of *Phytophthora ramorum,* the fungus-like plant pathogen that made its way from Europe to the United States. The pathogen is responsible for sudden oak death, the disease that has caused widespread dieback of tan oaks and coast live oaks in California and southwest Oregon.

"In the case of exotic plant diseases, DNA information may be used, as it is in criminal forensics, to identify possible culprits and to understand how they were introduced," said Garbelotto. "This provides governments with pivotal information needed to avoid repeated introductions of pathogens." Garbelotto works in the fungi collection storeroom of the Venice Museum of Natural History.

Garbelotto is working with Italian mycologist Giovanni Robich and Luca Mizzan, curator of Marine Biology at the Venice Museum of Natural History, to sort through the samples in the museum, which are being sent to Garbelotto's lab at UC Berkeley for DNA sequencing and analysis.

The Venice Natural History Museum is part of the Musei Civici Veneziani, a network of 11 museums in Venice. It is housed in the Fontego dei Turchi, a Byzantine-style palace on the Grand Canal that dates back to the 12th century. Before it was established as a museum in 1923, it had served as a trading depot for Turkish merchants.

"Often museums are seen as places where people just go and see things," said Garbelotto, who is doing this work during a sabbatical leave from UC Berkeley. "This shows that museums are actually involved in cutting-edge research. Providing a database of this scope is pretty novel."

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Spore Prints

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PUGET SOUND MYCOLOGICAL SOCIETY

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Annual dues $25; full-time students $15

CALENDAR

Feb. 7	Lichen class, 6:30 PM, Hitchcock Hall, UW
Feb. 13	Membership Meeting, 6:30 PM, CUH
Feb. 14	Lichen class, 6:30 PM, Hitchcock Hall, UW
Feb. 19	Board Meeting, 7:30 PM, CUH
Feb. 20	*Spore Prints* deadline
Feb. 21	Lichen class, 6:30 PM, Hitchcock Hall, UW
Feb. 29	Lichen class, 6:30 PM, Hitchcock Hall, UW
Mar. 10	Survivors' Banquet, 6:30 PM, CUH

DECEMBER BOARD NEWS — Dennis Oliver

Surviving the power outages and the Christmas rush, the board gathered for the last meeting of the year. Because of illness David Manus is unable to continue as treasurer and John Goldman has agreed to fill out the remaining term. The board discussed the role and future of the PSMS library and formed a library committee consisting of Ron Post, Dennis Oliver, Kim Traverse, and Marilyn Droege to continue the discussion and come up with recommendations to the board. Colin Meyer and Patrice Benson of the education committee have set dates for the spring classes and ideas for educational offerings. The lichen class has been set for January and a truffle weekend is being planned for the spring. Cost estimates from Magnuson Park and CUH are being gathered for the annual mushroom show and a venue will be decided at the next meeting. Happy Holidays to all!!!!

MEMBERSHIP MEETING

Tuesday, February 13, at 7:30 PM at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle

Dr. Beug

Want to know what's poisoning whom? Don't miss the February meeting, when Prof. Michael Beug, who chairs the Toxicology Committee of the North American Mycological Association (NAMA), will present "Reflections on Mushroom Poisonings."

All mushrooms were toadstools to Dr. Beug until 1969 when a fellow graduate student gave him some morels to try. As soon as fall arrived he went mushroom picking and came back with two shopping bags full of prime *Amanita muscaria*. That experience led him to take an adult education class from Dr. Daniel Stuntz at the University of Washington.

He was one of the early members of the Pacific Northwest Key Council, a group dedicated to writing macroscopic keys for identifying fungi, and for the past three years has served as its president. A member of NAMA since 1973 or 1974, Dr. Beug has created seven NAMA slide-tape programs on mushroom identification, prepared several other NAMA educational programs, and put some of the programs on the Web for use by the general public and hospitals dealing with mushroom poisonings. In 2006 he was the winner of the NAMA Award for Contributions to Amateur Mycology.

Please help welcome Mike Beug to Seattle!

Would persons with last names beginning with the letters M–Z, please bring refreshments for the social hour?

BOOK REVIEW — Kim Traverse

Macrofungi are where the good eats are, but fungi are everywhere! *The Mycological Handbook*, University of Washington Press (Russell B. Stevens, Ed., 2nd printing with minor corrections and index by Joseph Ammirati, 1981) shows you where to look, from chips of driftwood from the Sound to the hind-gut of soil invertebrates. Not everything is microscopic but it's good to be aware of the sheer range of fungi. Isn't it amazing that the basic architecture of the cap and stem spans several magnitudes? I'm in the PSMS library from about 5:30 PM on meeting days; please come in and browse.

JANUARY BOARD NEWS — Dennis Oliver

The board somewhat amazingly this winter has been able to avoid "'snow days" and no meetings have been cancelled (so no make-up meetings during the summer). John Goldman, treasurer, presented an initial annual treasures report for 2006. The club had income of $25,433.70 and expenses of $26,694.22 for a slight loss. The final figures will be available later. The board voted to hold the annual mushroom show on October 13 and 14 and to return the show to CUH. The lichen class will begin on January 31, and the spring mushroom class will begin in March. The election committee consisting of Joanne Young, Lynn Phillips, and Dennis Oliver is busy soliciting candidates for vice-president, secretary, and five board positions. The survivors' banquet this year will be on March 10 and will be a potluck.

MUSHROOM OF THE MONTH — Dick Sieger

Outside it's winter. Inside, we live in a subtropical climate. That's a welcoming environment for a wee yellow subtropical mushroom, *Leucocoprinus birnbaumii*, that grows with potted plants. Your field guide may call it *Lepiota lutea*.

L. birnbaumii is best observed with a 10× hand lens. It starts out as a bright yellow pinhead on the dark background of the soil. You may see troops of these yellow dots. They develop quickly into fragile mushrooms 1 to 3 inches tall with caps 1 to 2 inches across. The young caps are oval and become conical. The cap margins have grooves that follow the radial pattern of the gills underneath. Each stalk has a ring, and if you are dexterous, you may be able to slide it up and down the stalk. Caps and stalks are covered with yellow powder. Spores are 8–11 × 5–7 µm, oval-elliptical, have germ pores, are dextrinoid, and leave a white spore print. The mushrooms are literally ephemeral. Hour by hour bright colors fade, caps wilt, and in a day the mushrooms sag into the soil that bore them.

The only similar species around here is *Leucocoprinus cepaestipes* which is also a friend of cultivated plants. It is entirely white with dark brown or white powdery scales on the cap.

Neither species harms plants. Both are reported to be poisonous, at least for some people, but the fruitings are miniscule and hardly worth the attention of a cook. You wouldn't want to see a toddler grazing on them, though.

Leucocoprinus birnbaumii (*photos by Masana Izawa in* Fungi of Japan *by Imazeki, Otani, and Hongo)*

DEAD MAN'S FOOT — Else Vellinga

Mycena News, Myco. Soc. of San Francisco, May, 2006

When in August crumbly dog turds appear along the sidewalk, I know that autumn is coming, and my heart leaps up! These turds are MUSHROOMS. In a time of year when there is not much moisture around, in the midst of our rainless California summer, these mushrooms are able to grow and form these firm juicy fruit bodies. They are so firm, and are so turgid, that they can even push up the pavement and pop up in other unexpected places to shed their spores.

I remember a foray in Denmark into a dry sandy pine plantation where these weird fungi were sticking their heads up. Their ugliness was admired by all of us, but nobody wanted to be photographed with them. In New Zealand I have seen a related species just outside the fence that kept me from the dangers of a thermal vent.

Officially, the dog turd fungus is called *Pisolithus arrhizus*, one of many names for it. The name is derived from the Greek and means the "rootless pea-stone." Dead Man's Foot and Dye Ball are two common names for it. You'll also find "tinctorius"' as its species name, referring to its qualities as a dye for wool—this has been known for a long time; Micheli mentioned it already in his book from 1729. Can we assume that even in antiquity it was used as such?

Pisolithus arrhizus *breaking through asphalt in Berkeley. Photo by John Lennie.*

Older names for the genus include *Polysaccum*—the mushroom with the many bags. We can compliment all those mycologists in finding very suitable names for this species.

Pisolithus starts out as a club-shaped dark brown object, which when cut open shows those "peas"—little compartments in which the spores are formed. Arora described them as "Rice Krispies in tar"—a beautiful comparison. In this stage, the mushroom is firm, and wet, and stains your hands. In the next phase the top matures, the outer wall disintegrates, and a dark chocolate brown dry spore mass is visible. Those spores are well suited for air transport—they have pigmented hydrophobic walls and are spiny, real long-distance dispersers. The fruitbodies wither slowly and can, when not kicked, remain in place for months, until only a small depression in the ground might show their former place.

There is wide variation in the shape and size of the species—from round and small ones to humongous amorphous lumps. Do these forms represent different stages of one species or many species with each their own host? Only one species is commonly recognized here in the U.S.A. Until very recently all the *Pisolithus* found all over the world were thought to be just one species, but molecular research has shown that there are at least eleven different types, and several species beside those eleven have been described. More work is needed to show whether these are all good species. Some of these molecular types are only found with one host plant species, e.g., with Cistus, a shrub in the Mediterranean basin, or with Afzelia, a tree in Africa. One part of the genus is exclusively Australian, growing with Eucalyptus and Acacia, but now these species can be found far away from the place of origin, wherever Eucalyptus has been planted.

British authors speculated that their local *Pisolithus* had been introduced with the planted Eucalyptus, but the Northern Hemisphere species *P. arrhizus* (the species found in the Bay Area) does not associate with Eucalyptus. Most fungi mycorrhizal with Eucalyptus do not grow with other tree species at all. On the other hand, *P. arrhizus* can be found in the southern hemisphere growing with introduced pine species. To the surprise of Australian researchers, Eucalyptus planted in China picked up a local species which formed partial ectomycorrhizae with the tree roots but was detrimental to the growth of the trees. The whole point of planting the Eucalyptus there was to get a good crop of wood fast, so the newly planted trees will in the future be inoculated with a different *Pisolithus* species to accomplish that. earthstars and puffballs in the genera *Geastrum*, *Lycoperdon*, and *Bovista* are saprotrophes, decomposing dead plant material, but *Pisolithus* is an ectomycorrhizal associate.

Here in central coastal California it grows with coastal live oak, planted birch, cedars, Monterey pine, and other pine species. Just last autumn it popped up beside the European beech in our neighbor's yard, a truly surprising host. As already hinted at above, *Pisolithus* is widely used in initial inoculation of tree seedlings especially for forestry purposes. Here also different species are probably used, but the name given to the fungus is in most cases *P. tinctorius*. Paul Stamets' Fungi Perfecti sells a mycorrhizal mix containing *Pisolithus tinctorius* (with four species of *Rhizopogon*). *Pisolithus* is ideal as it is so well adapted to drought. Mine tailings, dry sandy areas, restoration projects—*Pisolithus* will grow and help establish the young tree seedlings. Judging from the abundance of the species with full-grown trees here in California,

cont. on page 4

Dead Man's Foot, *cont. from page 3*

it is also a good competitor that is not rapidly displaced by other fungal mutualists when the tree grows up.

Pisolithus arrhizus is a very common sight here, both in the city and in more natural habitats under oak. Many people who come to the fungus fair comment that it grows in their yard. It was the first species we saw when we stopped at a campground in the Yuba River area in the Sierra Nevada foothills last fall. In the northern Sierras and Lassen area it is common, especially in disturbed areas (like that campground), in foothill woodland, and in open oak woods. But it is not easy to get a good picture of its occurrence in the rest of North America. As the species fruits in those times of year that are too dry for others, they can easily be missed by "normal" mushroom forays. So there is only one record in the NAMA voucher database, from the 2000 foray in Newton, Texas.

The species is common in the northeast of the U.S.A., especially in the dry sandy and pine-forested areas along the coast, such as the New Jersey Pine Barrens, and Cape Cod (Gene Yetter, personal communication). It is also found in Florida (again Gene Yetter), and Alabama, and South Carolina. It is said to be common in the Pacific Northwest, but for the rest...? This species (group/complex) would be a great candidate for a national recording project! We should also look under eucalypts for other species than *P. arrhizus*. *Pisolithus albus* for instance has been found in Spain and Morocco, and *P. microcarpus* in Portugal.

From its appearance it is not easy to guess the closest relative of our dog turd fungus, but the presence of pulvinic acids and their derivates point in the direction of the boletes. These are the pigments that stain the wool. Molecular comparisons have confirmed that bolete connection (Binder & Bresinsky, 2002). In their study *Astraeus hygrometricus*, another drought-adapted "bolete," is a sister group to *Pisolithus*. A bit further removed in the family tree are *Scleroderma* and real boletes like *Gyroporus* and *Boletinellus merulioides*. Enjoy the presence of this species—your tree has a useful partner on its roots!

Further reading:

Binder, M. & A. Bresinsky, 2002. Derivation of a polymorphic lineage of Gasteromycetes from boletoid ancestors. *Mycologia 94*: 85–96.

Martin, F., J. D'ez, B. Dell & C. Delaruelle, 2002. Phylogeography of the ectomycorrhizal *Pisolithus* species as inferred from nuclear ribosomal DNA ITS sequences. *New Phytologist 153*: 345–357.

PRESIDENT'S MESSAGE — Patrice Benson

Thank You for Volunteering

I would like to begin this message with a huge Thank-You to some of our members who have stepped forward for the good of all members of PSMS. John Goldman was appointed by the board to take over the duties of the former treasurer, David Manus, who became ill and needed to relinquish his position. We thank David for the work he did and hope for his recovery. John has fulfilled the role of treasurer in the past, and we are confident in his leadership in the care of our treasury. Thank you, John, for your reliability and steadfastness.

Thanks also to Joanne Young, Lynn Phillips, and Dennis Oliver for stepping up to fill the nominating committee. They picked up the pace enough to ensure that our ballots will be in this *Spore Prints* with most of the candidates in place. Thanks to Pacita Roberts, who keeps the membership database, and Bernice Velategui, who collects the data, we have a great resource of the hobbies and professions of our members. It has made the job of finding candidates for offices much easier as the database is more up to date than our most current roster.

Kim Traverse has been manning the PSMS office each month for the hour preceding the membership meeting to give members a convenient time to peruse our library. We have an investment committee composed of John Goldman, Tony Tschanz, and Joanne Young to keep an eye on the pulse of the income-producing entities. Ron Post has taken on the task of Exhibit Chair for 2007. This year we will return to CUH for the exhibit, which is slated for October 13–14, the only weekend in October which is Husky-football free.

Thank you to Agnes Sieger and her husband, Dick, for creating this newsletter without which we would not be held together as an organization.

Volunteers Still Needed

We still require a few more volunteers for a couple of fun tasks:

First, PSMS needs a **banquet chair** who can take care of the few details left. (See banquet article for further information about the banquet.)

PSMS needs a **program chair**. This is the most fun job, as it would be YOU who determines the speakers and programs that our membership enjoys at each monthly membership meeting. If this interests you, please call me at the phone number below.

The last job is for a **co-chair of book sales**. Younghee Lee is currently doing her job solo, and it is truly more fun if it can be shared! Have you ever wanted to buy books with other people's money? Mushroom books!? Related good stuff to be sold at our meetings? We make a great portion of our income through book sales. It keeps the membership dues down to a small affordable sum. Twelve years ago I calculated that the actual cost of membership was $42. Our income from exhibit and book sales offsets this to an affordable $25.

We need *You*! If you can fill any of these positions, please call me (Patrice Benson) at **206–819–4842** to volunteer.

DNA databank, *cont. from page 1*

Museum curator Mizzan said the museum's vast collection of fungi got its start when the Venice Society of Mycology formed in the late 1980s to monitor the mycological flora in the Lagoon of Venice and surrounding areas. The collected samples represented over 1,200 species of fungi and formed the foundation of the museum's present collection.

Garbelotto noted that the relatively young age of the samples has been critical to obtaining good quality tissue for DNA analysis. The samples come from throughout Europe, with a significant number representing species found elsewhere in the world.

Rather than sequencing the entire genome of each species, the researchers are focusing on a non-coding region of the ribosomal DNA that is known to be unique in each species. The length of the region varies from around 450 base pairs to 900 base pairs, depending upon the taxa from which it is sampled.

"If you're going to cross-compare species, you've got to amplify the same region," said Sarah Bergemann, the post-doctoral researcher in ecosystem science who is heading the lab analysis work at DC Berkeley. Bergemann is working with Amy Smith, staff research associate at Garbelotto's lab, to process the samples Garbelotto sends from Italy.

"This will be important for people who study the evolutionary characteristics of fungi," said Bergemann. "They'll be able to use our database for cross-comparisons. It's also useful for people who study species distribution. For example, if you want to figure out how some species are related to one another, and you know something about their taxonomy, you can go back to their DNA to see if the morphological characteristics match their molecular code."

Without the DNA fingerprint, researchers traditionally need to wait for fungi to fruit, or produce mushrooms, to identify them. "This can be very limiting because mushrooms are only produced seasonally, with some species only fruiting once every several years," said Garbelotto. "The database we are creating will allow people to identify the fungi present in plants, in the soil, and in the air at any time. "

The project, which began in April, is expected to be completed by the end of 2007. "We do not know of any similar project in Europe, at least of this dimension," said Enrico Ratti, the museum's scientific director.

"The importance of this project is in the cooperation between different subjects, namely private collectors, a private association, a public municipal museum, and a foreign university," said Giandomenico Romanelli, director of the Musei Civici Veneziani. "We think that this is an exemplar model, to be followed in subsequent projects. Furthermore, in our philosophy, natural science collections are public goods that everybody belonging to the scientific community should be able to take advantage of."

13 December 2006. berkeley.edu/news/media

MISC. I.D.

Hildegard Hendrickson

As you may know, I am the PSMS coordinator for wild mushroom identification in the Greater Seattle area. Sometimes this function gets very interesting. People often ask first if there is a charge (there isn't) before they go on. Some people, like the two examples below, want to have their mushrooms identified over the phone, and get somewhat irritated when told that they have to bring them to a person.

In January, I received a phone call from a woman in Orlando, Florida, asking if I would identify a mushroom that had made her dog sick. I told her that I don't ID over the phone, but that if she could send me digital pictures by e-mail, I might be able to ID it. She did, and the mushroom was a *Scleroderma* sp. Her dog is getting well, and she offered me a dog (a Schnauzer—I believe she is a dog breeder) saying I would only have to pay the transportation.

Last fall, early Sunday morning, a couple called to have a mushroom ID'd because during the night they had gone to the emergency room suffering from cramps and second thoughts. They had a specimen left. Not only was it the toxic *Agaricus moelleri* Wasser (prev. called *A. praeclaresquamosus*), but it was also in very poor (nearly rotten) condition.

FUNGUS AFFECTS PORPOISES

Everett Herald

10/06 - A fungus that has killed four people in British Columbia is also affecting marine mammals, as well as dogs, cats, ferrets, birds, and horses.

"It is a rare disease here, and possibly an emerging disease," said Mira Leslie, who until recently was Washington state's public health veterinarian.

Tests have confirmed that *Cryptococcus gattii* has spread from Vancouver Island and possibly turned into the world's first known multispecies outbreak, said Stephen Raverty, veterinary pathologist with the Animal Health Center in Abbotsford, B.C.

Raverty has conducted necropsies on many of the animals stricken by the fungus. So far about 25 porpoises have died of the disease in the Pacific Northwest since 1999.

No one is sure how *Cryptococcus gattii* wound up in British Columbia. It is typically found in Eucalyptus trees in the tropics of Australia. Some think the fungus came to the area on a ship, on a Eucalyptus tree, or even on the bottom of shoes.

Others think the fungus has lived in the area for years but wasn't a threat to animals until temperatures increased. Laboratory tests indicate the fungus can reproduce in salt water. Raverty thinks porpoises become infected when they inhale a small amount of pathogen-filled water in their blowholes. The disease spreads to their lungs, often causing lesions. Many of the affected porpoises washed ashore were emaciated.

About 25 people become infected with *Cryptococcus* each year. Last year, the disease was found along the Vancouver Island coast and in the Fraser River Health District of British Columbia. In Whatcom County last year, one cat died of the fungus and two others were infected. A Washington man was also diagnosed with the disease, but he likely picked it up while traveling, said Leslie, who is currently an adjunct professor at Washington State University. He recovered.

It isn't clear if the fungus is to blame for the recent surge in harbor porpoise deaths in Washington. There has also been a surge in Oregon.

Known porpoise deaths have numbered around 30 per year since 2003 but this year 47 dead harbor porpoises have been found in Washington and Oregon. Most have washed ashore near inland waters. Raverty said about 10 percent of those porpoises tested positive for the fungus.

MOREL STORY

Dan and Kandie Miller
http://thegreatmorel.com

I had an uncle who hunted [morels] every year. He would save vacation days and use them in the spring for mushrooms. His wife would drop him off at our woods at 7:00 AM on her way to work. He would carry a cooler full of beer with him (and these were the days before lightweight coolers). His wife would pick him up at 5:30 PM on her way home. He would leave the woods with the beer gone and the cooler full of mushrooms. He would do this 2–3 times a week. None of the rest of the family could do that well. We finally decided by the time he drank half the case of beer he must have been crawling and that's how he found so many.

GETTING TO KNOW KNAPWEEDS

L. M. Wilson and C. B. Randall
Biology and Biological Control of Knapweed
USDA-Forest Service FHTET-2001-07, 2nd Ed., 2003

Knapweeds belong to the genus *Centaurea* and are members of the Sunflower family (Asteraceae). This is a very large and diverse family of plants which includes dandelions, sunflowers, and daisies. Most knapweeds are non-native to North America. They were brought to North America following the immigrant trail from Europe and Asia. Together, these Eurasian knapweeds form a large complex of species that are found throughout the United States and Canada. All told, 25 species of knapweeds occur in the two countries, predominantly as noxious rangeland weeds in the West.

Knapweeds are highly invasive weeds that are capable of forming large infestations under favorable conditions. Among the most troublesome are the diffuse knapweed (*Centaurea diffusa*), spotted knapweed (*Centaurea stoebi*), and squarrose knapweed (*Centaurea virgata* ssp. *squarrosa*). The meadow knapweed (*Centaurea pratensis*), brown knapweed (*Centaurea jacea*), and black knapweed (*Centaurea nigra*) are less known but are closely related to the others and share similar biology. (Squarrose knapweed does not occur in Washington, but does occur in Oregon, California, Nevada, and Utah.)

Current biological control agents used against knapweed include the insect larvae that feed in the seed head or root tissue, destroying it. Only the adult seedhead weevils eat foliage; otherwise adult insects generally don't damage the plant.

Knapweeds are distinguished by their bract shape, flower color, leaf shape, roots, seeds, and branching habit.

Spotted knapweed
(Centaurea stoebi)
and its distribution

FUNGUS MAY FIGHT KNAPWEED

Peninsula Daily News, 27 December 2006

AP, Moscow, Idaho - A University of Idaho researcher is hoping to harness the power of tiny fungi to combat an invasive weed that ranchers blame for crowding out nutritious forage for their livestock. George Newcombe is busy inside a greenhouse on the school's Moscow campus working with endophytes that live in spotted knapweed, considered one of the West's most-destructive noxious weeds.

Endophytes, fungi that colonize plant tissue and remain within it, are found in many plant species. Endophytes survive off the host and are believed to boost the plant's survival in exchange for nutrients they provide.

Now, Newcombe says he appears to have been able to isolate an endophyte that renders knapweed sterile. The fungus typically exists in low concentrations, but when it's cultured in a lab and sprayed in higher concentrations, it has a deadly effect.

"They may be the key," Newcombe told the *Spokesman-Review* newspaper during an interview in the greenhouse of the university's Center for Research on Invasive Species and Small Populations. He's planning field trials soon.

Historical records show the spotted knapweed came from Eastern Europe and Asia into North America about a century ago when it arrived in contaminated crop seed, according to the U.S. Department of Agriculture. With few natural enemies, the perennial with pink to light purple flowers spread across the continent.

It releases a toxin into the soil that can stunt plants that cattle eat. As a result, heavily infested areas often must be reseeded once the spotted knapweed has been eradicated.

As more and more of the West's isolated areas are filled up by the region's burgeoning population, knapweed continues to spread, often along highways, train tracks, power lines, and other areas newly being touched by human disturbance.

Endophytes that live on other plants have long been studied. For instance, Taxol, a cancer-fighting drug discovered in yew trees, is a compound produced by endophytes. Some endophytes produce grasses poisonous to grazing animals.

NAME CHANGES

Dick Sieger

Here's a note for mushroomers who are frustrated by name changes. You can find the currently accepted name at http://www.speciesfungorum.org/Names/Names.asp, but use an older name if you want to. It will make the index in your field guide more useful while you are waiting for a new edition. Remember. The mushrooms are constant. They haven't changed. It's just that someone has meddled with their names.

Election **Election** **Election**

This year we are voting for a Vice-President, a Secretary, and five Trustees. Please read the following profiles carefully and mark your choice on the enclosed ballot. Return your ballot to "PSMS Election Committee," 1916 North 49th Street, Seattle, WA 98103. A ballot box will also be available at the February meeting. Each family membership is entitled to two votes, and each individual membership to one vote. Ballots received after March 4, 2007, will not be counted.

Vice-President

This is a write-in position that consists mainly of finding speakers and programs for the monthy meetings.

Dennis Oliver ***Secretary***

I have just completed my first term as PSMS secretary. I would like to continue to serve PSMS as secretary. I have a degree in botany from the University of Washington, studying with Dr. Stuntz, and worked for my Masters degree with Dr. David Hosford at Central Washington University. I am a member of NAMA, the PNW Key Council, the Mycological Society of America, and the American Urological and Lichenological Society.

Trustees

Lynn Phillips

Since joining PSMS in 1986, I have been active in various committees and board positions. I am currently finishing a term as trustee and would appreciate your vote to continue in that position for another two years.

Milton R. Tam

After earning an advanced degree in microbiology and immunology from the University of Washington, I worked as a research scientist at the Fred Hutchinson Cancer Research Center, Genetic Systems Corporation, and the Program for Appropriate Technology in Health. Recently retired, I am now a consultant.

Kim Traverse

I'm the volunteer librarian for the society and I'm fascinated by the huge variety of fungi in the world and the very central role they play in ecology. PSMS is a perfect place to share that enthusiasm.

Molly Bernstein

It would be great to serve on the board for another term. Along with keeping the Website up to date, I enjoy helping with the annual show and getting out on field trips to hunt both mushrooms and lichens.

Brenda Fong

I have been a member of PSMS since 2000 but have had little opportunity to be involved since moving to Bremerton. Now I am returning to Seattle and would like to become an truly active member. I would appreciate your vote to give me an opportunity as a Board member.

Cynthia Nuzzi

I joined PSMS in 2004, as soon as I moved here. My mushrooming passion is rooted in my family in Italy. My interests include walking in the woods, mushrooming, art, traveling, cooking, gardening, and more. I would be very happy to support the growth and activities of PSMS by joining the Board.

Kevin Bernstein

I have been a member since 2003, and have enjoyed many field trips, along with my wife Molly. It's been great to help out at the annual show, and also with the PSMS Website. I would be pleased to serve on the board.

MUSHROOM FRITTERS

Olson's Food Stores
Michael Blackwell, Executive Chef

Baby mushrooms are perfect for bite-size fritters. Fry until golden and serve sprinkled with lots of freshly grated Parmesan in napkin-lined baskets.

18 baby mushrooms (or use larger mushrooms cut in quarters)
1 cup unbleached all-purpose flour
2 tsp baking powder
2 tsp granulated garlic
2 tsp dried oregano
2 tsp dried basil
1 tsp salt
1 tsp freshly ground black pepper
½ tsp crumbled dried rosemary
2 large eggs
Vegetable oil for frying
1 cup freshly grated Parmesan cheese
½ lemon

Makes 18 fritters

Blend herbs in small processor or mortar and pestle. Mix the flour, baking powder, garlic, oregano, basil, salt, pepper, and rosemary in a mixing bowl. Beat the eggs in another bowl.

Heat vegetable oil in a deep-fat fryer to 375°F.

Dip the mushrooms first into the beaten egg and then into the flour mixture. Fry 6 to 8 pieces in the oil until golden on the outside and tender inside, 1 to 2 minutes. Drain on paper towels. Keep warm on a serving platter while frying the remaining mushrooms.

When all the mushrooms have been fried, sprinkle them with lemon, then Parmesan. Serve immediately.

Le Gratin Des Champignons, Roland Sabatier and Georges Becker, 1986

The eternal conflict

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Center for Urban Horticulture
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