

SPORE PRINTS

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AN ANCIENT CONVERSATION BETWEEN PLANTS, FUNGI, AND BACTERIA

University of Wisconsin-Madison. "A touching story: Ancient conversation between plants, fungi and bacteria."

Science Daily, August 27, 2014

www.sciencedaily.com/releases/2014/08/140827163328.htm

The mechanical force that a single fungal cell or bacterial colony exerts on a plant cell may seem vanishingly small, but it plays a heavy role in setting up some of the most fundamental symbiotic relationships in biology. In fact, it may not be too much of a stretch to say that plants may have never moved onto land without the ability to respond to the touch of beneficial fungi, according to a new study led by Jean-Michel Ané, a professor of agronomy at the University of Wisconsin-Madison.

Many people have studied how roots progress through the soil when fairly strong stimuli are applied to the entire growing root," says Ané, who just published a review of touch in the interaction between plants and microbes in the journal *Current Opinion in Plant Biology*. "We are looking at much more localized, tiny stimuli on a single cell that is applied by microbes."

Specifically, Ané, Dhileepkumar Jayaraman, a postdoctoral researcher in agronomy, and Simon Gilroy, a professor of botany, studied how such a slight mechanical stimulus starts round one of a symbiotic relationship—that is, a win-win relationship between two organisms.

It's known that disease-causing fungi build a structure to break through the plant cell wall, "but there is growing evidence that fungi and also bacteria in symbiotic associations use a mechanical stimulation to indicate their presence," says Ané. "They are knocking on the door, but not breaking it down."

After the fungus announces its arrival, the plant builds a tube in which the fungus can grow. "There is clearly a mutual exchange of signals between the plant and the fungus," says Ané. "It's only when the path is completed that the fungus starts to penetrate."

Mycorrhizae are the beneficial fungi that help virtually all land plants absorb the essential nutrients—phosphorus and nitrogen—from the soil. Biologists believe this ubiquitous mechanism began about 450 million years ago, when plants first moved onto land.

Mechanical signaling is only part of the story—microbes and plants also communicate with chemicals, says Ané. "So this is comparable not to breaking the door or even just knocking on the door, but to knocking on the door while wearing cologne. Clearly the plant is much more active than we thought; it can process signals, prepare the path, and accept the symbiont."

Beyond fungi, some plants engage in symbiosis with bacteria called rhizobia that "fix" nitrogen from the atmosphere, making it available to the plant.

Rhizobia enable legumes like soybeans and alfalfa to grow without nitrogen fertilizer.

When Ané and his colleagues looked closer, they found that rhizobium symbiosis also employs mechanical stimulation. When the bacterium first contacts a root hair, the hair curls around the bacterium, trapping it.

The phenomenon of curling has been known for almost 100 years. "But why would nature develop such a complicated mechanism to entrap a bacterial colony?" Ané asks. "We propose the purpose is to apply mechanical stimulation" so the plant will start building a home for the rhizobium—for mutual benefit. "We have preliminary evidence that when the entrapment is not complete, the process of colonization does not happen," he says.

Again, the two-step communication system is at work, Ané adds. "The curling process itself can only begin when the plant gets a chemical signal from the bacterium—but the growing tube inside the root hair that accepts the bacteria requires something else, and nobody knew what. We propose it's a mechanical stimulation created by entrapping, which gives the bacterial colony a way to push against the root."

In many respects, this symbiosis parallels the older one between plants and beneficial fungi, Ané says. Indeed, he says legumes have "hijacked" the mycorrhizae system. "Plants used the symbiosis toolkit to develop this relationship with mycorrhizae, and then used it again for bacteria. This dual requirement for chemical and mechanical signals is present in both associations, even though the association between rhizobia and legumes is only 60 million years old."

CANINE MUSHROOM POISONINGS CONCERN CALIFORNIA VETERINARIANS Megan Hansen

<http://www.marinj.com/marinnews/>, Sept. 19, 2014

Foraging for mushrooms can be a fun activity for those well versed in toadstool identification, but for dogs the ingestion of certain fungi can be deadly.

A small percentage of mushrooms that grow in Marin County can cause liver failure. Dr. Peter Bowie, veterinarian at Pet Emergency and Specialty Center of Marin in San Rafael, said he's seen an uptick in cases this year of dogs sickened by mushrooms from the *Amanita* genus—including poisonous Death Cap mushrooms [*Amanita phalloides*].



Amanita phalloides

"We had 25 confirmed cases in the last three to four years of mushroom toxicity and maybe twice as many cases in which we thought dogs had mushroom toxicity," Bowie said. "We've seen 17 confirmed cases just this year."

These mushrooms are typically found from mid-fall to late winter. So to see so many cases already is of concern to Bowie, who has practiced in Marin since 1999. He said published medical journal studies show a 90 percent mortality rate

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MEMBERSHIP MEETING

Tuesday, October 14, 2014, at 7:30 pm at the Center for Urban Horticulture 3501 NE 41st Street, Seattle

For our October meeting, ace photographer Taylor Lockwood will present "Spirits of the Forest," featuring his worldwide search for bioluminescent and other exotic mushrooms amid the gorgeous wilds of Brazil, Madagascar, China, the USA, New Zealand, and Australia.



Taylor Lockwood

Taylor's thirty year career in mushroom photography has given him stories from most parts of the globe, and some of the most alluring images of mushrooms ever taken. His work has been acclaimed by mycologists, mushroom enthusiasts, photography critics, and nature lovers around the world. Anyone who has seen any of his previous presentations knows why. Don't miss this opportunity to enjoy a fascinating show.

Would people with last names beginning with the letters A-K please bring a snack or treat to share after the meeting.

Taylor F. Lockwood



INVASION OF THE BODY SNATCHERS (New Jersey Mycological Association version)

Alen Kalati

NJMA news, Sept.-Oct. 2014

It was my pleasure to attend the Victor Gambino Foray and seminar this past June. I must admit, though, that it wasn't what I expected it to be. I came to the foray expecting this amazing culinary event where everyone walks the woods and finds a variety of edible mushrooms and we all end up cooking them together and enjoying them at dinner. Seriously, that was what I expected.

Instead, I found that the foray is, essentially, about collecting various mushroom species, identifying them, and then logging the information. I remember sitting at one of the lectures, observing the mycologists around me, each excited over a type of mushroom they had found, the speaker announcing so excitedly the "Bolete" he had found. This was my first foray ever. I didn't know a Bolete from an Oyster. I was looking around the room, at everyone fixated on these fungi they had found, meticulously identifying and cataloging every little detail, logging where they had been found, on what substrate, and photographing them. I began wondering what is driving these people. What makes a group of people spend a weekend doing this? Then I remembered a video I saw on YouTube in which fungi called "Cordyceps" infect and in turn take control of an ant's brain, forcing it to climb a tree just to die and spread the fungus' spores.

"Is it possible that some sort of a fungus took control of my colleagues' brains and caused them to want to meticulously collect, catalog, photograph, and test all these mushrooms?" I wondered. For a moment, I entertained the idea, but then suddenly I realized that despite not having tasted a single wild mushroom on this foray, I was actually enjoying it. "NOOOOO!" I thought. "I have been infected!"

CALENDAR

- Oct. 4 Field Trip (see website)
- Oct. 9-12 NAMA Foray, Camp Arnold near Eatonville, WA
- Oct. 14 Membership Meeting, 7:30 pm. CUH
- Oct. 18 Field Trip (see website)
- Oct. 20 Board Meeting, 7:30 pm, North Seattle Community College
- Oct. 21 *Spore Prints* deadline
- Oct. 25 PSMS Annual Wild Mushroom Show (PSMS only)
11 am - 7 pm, The Mountaineers, Magnuson Park
- Oct. 26 PSMS Annual Wild Mushroom Show (public)
10 am - 6 pm, The Mountaineers, Magnuson Park
- Nov. 1 Field Trip (see website)
- Nov. 11 Membership Meeting, 7:30 pm. CUH

*There are mushrooms that are pretty;
There are mushrooms that are not.
There are mushrooms that smell gorgeous,
And some that stink a lot.*

*There are mushrooms that are commonplace,
And some that are incredible.
But the mushrooms that attract me most
Are the species labeled "edible."*

—Don Goetz

for dogs who eat toxic mushrooms.

“A known ingestion of a mushroom should prompt an immediate visit to your veterinarian,” Bowie said. “Puppies seem to be more likely to get involved in it than an older dog.”

No one knows for sure why dogs eat mushrooms, but most chalk it up to curiosity. It’s also possible dogs are attracted to [Death Caps] because of their fishy odor, according to the North American Mycological Association.

Bowie said poisoning symptoms include vomiting accompanied by progressive depression, lethargy, and a loss of appetite. Symptoms can get worse with time and typically don’t present for many hours, eventually evolving into diarrhea, a yellowing of the skin and eyes known as jaundice, and even seizures.

While Dr. Laura Landman, veterinarian at Animal Hospital-San Anselmo, hasn’t seen any confirmed cases of mushroom poisonings at her practice this year, she said toxic mushrooms are always of concern in Marin.

“Whenever we have a dog come in with elevated liver values, we always ask people to check their yards for mushrooms,” Landman said. “The mushrooms actually start to kill off the liver cells.”

If dogs are seen by a veterinarian early enough, she said the prognosis is typically good.

“If seen within 30 minutes, we can make them vomit and get the mushrooms out. Then we can get them on supportive care like fluids,” she said. “Sometimes we’ll also give them activated charcoal and that binds toxins in the bloodstream.”

Those canines unable to be seen right away are typically hospitalized and given massive amounts of drugs and supplements to support the liver. Canine blood plasma and dextrose are given intravenously, and anti-vomiting medications are also part of the protocol.

Bowie said a human in a similar situation would be extremely ill. “In humans, they’d be treated with dialysis followed by a liver transplant,” he said.

Dr. Bob Poppenga, a veterinarian and specialist in veterinary toxicology at the California Animal Health and Food Safety Laboratory at University of California at Davis, said the laboratory has examined more submissions this year that link animal illnesses to toxic mushrooms than in years past.

He said the diagnostic lab is one of the few that has developed a method to detect mushroom toxins in animals.

“Most of the time we’ll use urine and if it’s an animal that unfortunately dies we can look at the tissue for the presence of the toxin amanitin,” Poppenga said. “There are other things that can cause liver damage, so this allows us to confirm a cause.”

In addition to the Death Caps, Poppenga said the lab also sees samples showing animals often ingest *Amanita ocreata* mushrooms, known as the Destroying Angel.



All the doctors agreed the best way to keep dogs from eating mushrooms is to remove and dispose of any mushrooms growing where a dog may roam. Pet owners who suspect poisoning are encouraged to get their canine friends to a veterinarian as soon as possible.

DOG WALKERS TOLD TO BE WARY OF “POISON” ON ROAD

The Blackpool Gazette, Sept. 24, 2014

Pet owners in Fylde are being put on high alert after two dogs have died and dozens more reported sick following walks down Green Drive, Lytham. All were reported as throwing up yellow bile.

Fylde Council has not told dog walkers to avoid the area, but has called for walkers to ensure their dogs are kept on leads at all times and sticking to the main pathway while investigations are made.

Anne Pennington’s spaniel Maisy, 11, died on Tuesday night after falling sick last week from eating something on Green Drive. Pennington, who lives in Bellingham Road, added: “A dog called Charlie that lives next door but one to us also walks down Green Drive and had been there on the same day I took my dogs. Charlie was also violently sick but he is a younger dog so might have been able to fight it better.”

A Fylde Council spokesman said there was no poisoning of squirrels or any other animals, and the council was not engaged in any form of pest or plant control.

“We are continuing to look down paths and searching in bushes for anything suspicious,” the spokesman added. “But for the moment it’s a complete mystery to us.”

“An educated guess would be poisonous fungus, as we are at that time of year when it develops quickly.”



FIVE WAYS TO PAIR WINE WITH MUSHROOMS

Robert Johnson

Vinasse Today, Sept. 16, 2014



Mushrooms and wine? You bet. And in many more combinations than you might imagine.

Obviously, mushrooms—like so many other foods—taste differently depending upon how they’re prepared. As a result, they can be paired with an extremely wide spectrum of wines—everything from Champagne to Cabernet Sauvignon.

Here are five of our favorite combinations:

Cream of mushroom soup—A creamy, oak-aged Chardonnay.

Mushroom risotto—This combo is easy to remember because it comes in the form of a short poem: risotto with Barolo. A well-chilled sparkling rosé also works nicely, especially when dining al fresco.

Mushrooms in a tomato sauce—You’ll find these ingredients in many Italian dishes, so it’s wise to go with an Italian wine such as Chianti Classico. You may also opt for a “Cal-Ital” wine—Sangiovese.

Stuffed Portabello mushrooms—Think “big red”—Cabernet Sauvignon. Zinfandel. Syrah. If the wine pairs well with a steak, it will work with this dish.

Mushroom quiche—We love this pairing because it requires not one, but two wines: Pinot Grigio or Pinot Gris to go with the eggs and cheese, and Pinot Noir to go with the mushrooms.

CANADIAN POSTAGE & POSTAL ITEMS WITH FUNGI

Brian S. Luther

Canada, the second largest country in the world and our neighbor to the north, has several different official postal items that illustrate fungi. These are listed and discussed here. All catalog numbers are from the Scott Postage Stamp Catalogues. M = mushrooms or fungi as the main illustration; MID = mushrooms or fungi in the design of the stamp, in the background, or in the border of official postal items; FDC = first day cover, which is an envelope with the stamps affixed and canceled on the first day of the stamp or stamps' issue; cachet = an envelope (cover) illustration; s/s = souvenir sheet; presentation pack = a special packet or folder with the stamps mounted on an attractive background of the same theme, often with additional information about the set. Usually these cost a little bit more than the stamp set itself and are collector's items.

Canadian Postal Items with Fungi

Cat. #	Date	Value	Type	Species or Description
1245	8/4/1989	38¢	M	<i>Boletus mirabilis</i>
1246	"	"	"	<i>Morchella esculenta</i>
1247	"	"	"	<i>Cantharellus cinnabarinus</i>
1248	"	"	"	<i>Clavulinopsis fusiformis</i>
The primary illustration on this presentation pack of four stamps is <i>Trametes versicolor</i> ; the FDCs show additional illustrations on the cachet as well as an <i>Amanita</i> on the cancel. (See text and photos for details about these and two separate informational books issued by Canada Post that show fungi.)				
1272 & 1273	5/3/1990	n/a	MID	Fungi only on back cover of booklet
2170	8/23/2006	51¢	MID/M	Canadian wine & cheese
2171 (set 2168–71)	"	"	"	"
2171a	"	n/a	"	Booklet
2461	4/21/2011	"	M & MID	s/s
2463	"	"	M	<i>Amanita muscaria</i>
2463a	"	"	M & MID	Booklet (see text for details)

Comments

Scott 1245–1248

Canada Scott 1245–1248 is the first set of stamps issued by a North American country that has mushrooms as the main illustration. (Mexico was the first country in North America to issue a stamp with a fungus, but it's not the main illustration; see Luther, 2013a.) This set came in full sheets of 50, with selvage, and all stamps are gummed. Note that the four stamps in the block are



Scott 1245-1248

not in catalog order left to right. That's because this sheet of stamps can be broken up into different blocks. Of the four species in this set, three are good edibles. Both *Boletus mirabilis* and morels are much sought after. *Cantharellus cinnabarinus* is very common in the eastern US, but mycophiles here don't get the pleasure of finding it. In the late 1970s I often found it in the southern Appalachians of both Tennessee and North Carolina in summer and fall.

It's delicious, and the striking color makes for a very colorful dish when prepared. *Clavulinopsis fusiformis* is edible, but mediocre because it lacks a good consistency and flavor.

In the presentation pack issued for this set, the four stamps are mounted in a clear sleeve, with the entire cover featuring *Trametes versicolor* on both the front and the back. Although this polypore is the main illustration on the presentation pack, it is not on any of the stamps in the set. When you open the presentation pack, titled "Mushrooms of Canada," a cute illustration of *Cantharellus cinnabarinus* pops up, like you'd find in a children's book. Two different FDCs were issued for this set as well. The first has all four stamps on a single envelope (cover); the cachet shows a morel and the bolete along with microstructures of each; the cancel shows a Death Cup *Amanita* with three maturing basidiocarps as seen in longitudinal section (egg button stage, half grown, and mature). The other FDCs show each of the four individual stamps on separate envelopes, with the same cachet and cancel just mentioned. Also, the back side of the FDC tells all about each of the four mushrooms in the set.



Cover of presentation pack for Scott 1245–48, with *Trametes versicolor*.



Inside of presentation pack for Scott 1245–48 with pop-up *Cantharellus cinnabarinus*.



FDC for Scott 1245-48 with morel and *Boletus* cachet and an *Amanita* cancel.



Front cover of Canada's Stamp Images No. 1 book, 1989 (see text).

(formerly *Stropharia squamosa* var. *thrausta*). The inside pages show an FDC with the four-value set above, as well as an article titled "Marvelous Mushrooms" with even more color illustrations and a tasty recipe to try. Also, the envelope that the Images book was sent in has the same mushroom on the cachet, so there are several mushroom-related items to collect. But there's still more.

In addition, a 42 page book was issued by Canada Post titled *Souvenir Collection of the Postage Stamps of Canada 1989* with all the stamps in it and a lot more text and illustrations relating to the issues from that year. Page 18, titled "Mushrooms: Fascinating Fungi," has photographs of some of the fungi that are on the set of stamps. Unfortunately the photograph of the bolete shows two basidiocarps of *Suillus luteus* (Slippery Jacks), not *Boletus mirabilis*—oops! It's clear that they failed to consult with a mycologist on the ID here.



Brian S. Luther

Page 18 from Souvenir Collection of the Postage Stamps of Canada 1989 book.

So, all told, eight different species of fungi are illustrated on the official Canadian postal items related to Scott 1245–1248: *Cantharellus cinnabarinus*, *Morchella esculenta*, *Clavulinopsis fusiformis*, *Boletus mirabilis*, *Trametes versicolor*, *Amanita* sp., *Loratiomyces squamosus* var. *thraustus*, and *Suillus luteus*. (Regrettably, the familiar morel name *M. esculenta* has been replaced as a result of DNA studies. Instead, we have several new species. Refer to my review of the new book *Ascomycete Fungi of North America* by Beug et al., Luther 2014, for a discussion of some of these recently described species of morels.)

Scott 1272 & 1273

The next item from Canada Post showing fungi is a booklet titled "Moving the Mail. The Story of Canada's Postal System." Only the back cover of the booklet shows fungi, a small picture of the "Souvenir Collection of the Postage Stamps of Canada 1989" (mentioned in the previous paragraphs). The left-hand page shows the four-value mushroom section, with separate mushroom illustrations and text; the right-hand page shows the four value set by itself, as well as the same set shown separately below. Because this single booklet contains two different stamps, the Scott Catalogue has given it two numbers (see table) although the stamps themselves do not show any fungi.



Back of booklet for Scott 1272 & 1273 (see text).

Scott 2170 & 2171

The third postal item with fungi is the right front outside cover of Canada booklet 2171a, which shows a round of cheese covered with mold, on which is a smaller wedge of yellow cheddar. The mold growth is obvious and is most likely *Penicillium roquefortii* or *Penicillium camembertii*, the two common species growing on and flavoring cheeses. The variety of cheese is not specifically mentioned, however, so we don't know for sure. The two stamps (2170 & 2171) are photographs designed and shaped to appear like cheese labels. All these stamps are die cut and self-stick.

Scott 2170 & 2171 showing moldy cheeses (see text).



Brian S. Luther

Scott 2461–2463

The next set of postal items, 2461–2463, contains many details that need to be described and explained. Canada 2463a is a booklet that commemorates the International Year of Forests for 2011. This booklet contains eight stamps. The outside front cover of the booklet itself shows a giant Douglas Fir (*Pseudotsuga menziesii*) with white silhouettes of animals but no fungi. The back cover, however, has color pictures (a preview) of both the souvenir sheet and the FDC, each with mushrooms. The set itself features a tree and mushrooms as the main illustrations. These are what Canada Post calls Permanent Stamps, with no value shown. They are equivalent to our US Postal Service Forever Stamps. The stamps in the booklet are die cut and self-stick.



Inside of booklet Scott 2463a with eight stamps. Scott 2463a, booklet cover.

Back of booklet Scott 2463a showing the s/s and FDC.

Scott 2461 is the souvenir sheet (s/s); it shows a continuous scene of the two stamps together. The Douglas Fir stamp (2462) towers above; below it is the *Amanita muscaria* stamp (2463). The actual *Amanita* stamp shows three basidiocarps; two more mushrooms of the same species are shown next to these in the overall illustration but



cont. on page 6

Canadian Mushroom Stamps, cont. from page 5

outside of the stamp itself. Thus a total of five mushrooms are shown. Curiously, the stamps on this s/s are all perforated, with gum (unlike the booklet, which has self-stick stamps). The set of just the two stamps by themselves (2462 & 2463) does not show the additional two mushrooms, nor does the FDC, which has a panorama of trees all across the front of the cover. Only the souvenir sheet (2461) and the back of the booklet show all five mushrooms at the same time. This set is especially pertinent to us in western North America because in many of our conifer forests Douglas Fir is the predominant tree or a major component in the forest tree associations.

For mycophilatelic reports on other countries or territories in North America to date, refer to Luther, 2013a–2013d.

Souvenir sheet Scott 2461 (see text for details).



Brian S. Luther

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SOUTH CAROLINA MUSHROOM GATHERING CELEBRATES LEGAL FUNGI Stratton Lawrence

<http://www.charlestoncitypaper.com/>, Sept. 12, 2014

As recently as July, if a Charleston chef offered chanterelle or chicken-of-the-woods mushrooms on their menu, there's a good chance diners were eating illicit goods. Although the Lowcountry's forests (and suburban woods) are rich in edible fungi, it was illegal to harvest and serve wild mushrooms to paying customers.

That law changed this summer, thanks to the combined efforts of GrowFood Carolina and a handful of dedicated mycology enthusiasts. At the First Annual Mushroom Gathering last night, GrowFood Carolina general manager Sara Clow told an audience of around 100 about her surprise three years prior when she learned that foraging and selling mushrooms in South Carolina was not legal. "At the time, we [South Carolina] was one of only three states where serving edible wild fungus was against the law," she explained.

Inspired by the lobbying efforts of a friend, Clow and colleagues at the Coastal Conservation League began a three-year campaign to overhaul the regulations regarding wild mushrooms. Their effort paid off.

In early August, the first class of certified foragers "graduated" after a two-day course at Caw Caw Interpretive Center. Now the state has 30 certified mushroom experts.

Their results were deliciously displayed at the First Annual Mushroom Gathering, held at GrowFood's warehouse last Thursday. Of the 10 restaurants represented, The Lot's Alex Lira won the colorful presentation category with a dish of chanterelles served over cracked bread with a puree of beets and mascarpone cheese and topped with live tarragon and garlic chive blossoms. But The Lot had plenty of competition in flavor.

Warehouse chef Emily Hahn stuffed profiteroles (like tiny croissants) with a decadent oyster mushroom butter reduction and porcini powder, while Tristan's bite-sized shiitake tarts demanded that we eat just one more, several times over. The Seabrook Island Club was a popular booth, thanks to royal trumpet mushrooms and scallops generously dusted with morel powder. The Hominy Grill refreshed with a simple mushroom and hominy stew including classic button mushrooms (they're so unhip that they're hip again), while Husk's pickled chanterelles went down easy with blue crab and Asian pear, citrus, and watermelon "ponzu."

Because of the dry weather in the weeks immediately following the law change, most chefs relied on farm-grown shiitakes and oyster mushrooms. Others, like Husk, used foraged stock. Middleton Place surprised diners, however, with chicken-of-the-woods and chanterelles harvested that very morning by director of food and beverage Micah Garrison, thanks to his recent certification and 12 square miles of woods just outside their restaurant.



Hunter McRae

Middleton Place's Micah Garrison shows off chicken-of-the-woods he harvested that morning.

EXCLUSIVE MATSUTAKE MUSHROOMS GOING "CHEAP"

Jun Hongo

<http://blogs.wsj.com/japanrealtime>, Sept. 25, 2014



A gloomy summer has pushed up the wholesale prices of many everyday vegetables in Japan, but it has had the opposite effect on a more exclusive item at the other end of the price scale: matsutake mushrooms.

A wet summer with a sudden temperature drop late in the season is just what the premium mushroom needs, matsutake sellers say.

"We typically open our store in late September, but this year we were in business by the middle of the month to accommodate the early arrival of matsutake," said Koji Kanemitsu, who manages a matsutake mushroom store in Hiroshima.

“Last summer we were selling a kilogram for more than ¥100,000 (\$920), but so far this year we have them available for half that price,” he said, noting the volume of supply was much larger than last year.

According to the latest farm ministry data, the average price of lettuce per kilogram in early September was 65% higher than the average for the past five years. Cabbage and cucumber prices were also up by more than 40%, the ministry figures show.

Matsutake grow on the roots of red pines and are prized by aficionados for their strong distinctive scent. They are often steamed, grilled, or cooked in rice or soup.

MAGIC MUSHROOMS COULD HELP SMOKERS KICK THE HABIT

Jessica Firger

<http://www.cbsnews.com/>, Sept. 11, 2014

No, you’re not tripping! A hallucinogenic chemical in the fungi known as “magic mushrooms” could help longtime smokers kick the habit, according to a new study.

Researchers at Johns Hopkins University found that smokers who have a history of failed cessation attempts were able to successfully quit when they took psilocybin under the guidance of a physician, along with receiving cognitive behavior therapy.

For the study, published in the *Journal of Psychopharmacology*, researchers gave doses of psilocybin to 10 men and five women who had a history of heavy smoking. They smoked an average of 19 cigarettes a day for 31 years and had a history of failed attempts to quit. Two-thirds of the group reported they’d used psychedelic drugs recreationally at some point in their life but as much as three decades before; the remaining five had never taken hallucinogenics.

The researchers counseled study participants on what effects they might feel from the drug, then provided one psilocybin pill to each participant on the day they wished to begin a cessation program. After taking the drug, study participants spent a session of at least six hours with researchers in a “homelike” setting. They wore eye shades and headphones to help relax. They were given additional, higher doses two weeks and eight weeks later.

Each smoker also received regular cognitive behavior therapy on an individual basis that included techniques such as keeping a diary to track triggers that resulted in cigarette cravings.

The study found that after six months, 80 percent of participants who were given the psychedelic drug were still not lighting up, compared with 35 percent of people who took varenicline, the most effective medication currently prescribed to help smokers quit. Other aids, such as nicotine replacements, typically have a success rate of less than 30 percent. Researchers also found the smoking-cessation benefit of psilocybin continued, even after the effects of the drug wore off.

The researchers strongly cautioned that their study is not an endorsement of do-it-yourself psychedelic drug use for smoking cessation.

This study was federally funded and part of long-term research into how psychedelic drugs could be used to help to treat addiction. The researchers plan next to look at the efficacy of psilocybin versus nicotine patches and use MRIs to study brain activity.

This is not the first study to examine how magic mushrooms may alter the brain in therapeutic ways. A study published in the *Proceedings of the National Academy of Science*, in 2012, found that the substance could be an effective treatment for depression. In that study, brain scans of study participants showed decreased levels of activity in the “hub” regions of the brain, which are responsible for consciousness, self-identity, and organizing sensory information.

ICKY SOLUTION TO DIAPER WASTE—GROW MUSHROOMS ON THEM

Tanya Lewis

<http://news.discovery.com/>, Sept. 5, 2014

Disposable diapers are made of some of the most indestructible materials on Earth, but a group of researchers at the Autonomous Metropolitan University in Mexico has found a way to degrade the soiled garments: by growing mushrooms on them.



The scientists grew the oyster mushroom *Pleurotus ostreatus* on a substance made from used diapers, and were able to reduce the diaper’s weight and volume by up to 80 percent, according to a news statement.

Disposable diapers last for hundreds of years in landfills, and the average baby goes through 8,000 diapers during its infancy, according to the U.S. Environmental Protection Agency.

Diapers contain the plant-based material cellulose, which mushrooms consume, but they also contain nonbiodegradable materials such as polyethylene, polypropylene, and a superabsorbent gel known as sodium polyacrylate.

To grow the fungus, the researchers only used diapers that contained liquid waste. They sterilized the garments in an autoclave, a device that subjects them to high-pressure steam. The scientists then ground up the diaper remains and mixed them with lignin from the remains of pressed grapes, coffee, or pineapple tops. (Lignin is a woody substance the mushrooms need in order to grow.)

The researchers also used commercially available fungus spores grown on wheat or sorghum, which they spread on the diaper mixture. The icky substance was kept in a plastic bag for three weeks in the dark, under controlled temperature and humidity, and was then exposed to light.

After 10 to 12 weeks, the diaper mixture degraded enough to reduce its volume and weight by up to 80 percent, the researchers said. For example, about 2.2 lb (1 kilogram) of diapers would end up as 7 to 10 oz (200 to 300 grams) of mushrooms.

Although the main purpose of growing the mushrooms was to degrade the diapers, the researchers decided to taste their crop.

They knew the diapers did not contain any contaminants or parasites, since the diapers were sterilized. The mushrooms had similar amounts of protein, fat, vitamins, and minerals as commercial yeast.



The mushrooms were grown on a small scale, and were not intended to be sold for human consumption. But, they could be used as a supplement for cattle feed.

PRESIDENT'S MESSAGE

Marian Maxwell

Posters: If you picked up posters at last month's meeting, now is the time to hang up those posters in your communities. You will be able to pick posters up at the October meeting as well.

Show tickets: Tickets for Sunday for the general public or PSMS members who wish to come Sunday are now for sale online on our website under "events." Remember that PSMS members get into the show for free on Saturday, and invited guests can accompany PSMS members on Saturday but must pay the normal admission fees. We do not have tickets online for invited guests who wish to come on Saturday; they will be able to pay at the admission tent.

Show volunteer sign-up: You can now sign up online under "events" to help this year with the show or you can sign up at the October meeting. There are separate online sign-ups for Saturday and Sunday as well as a sign-up to volunteer whenever needed. We need a lot of people to put a show together! Many people wanted us to overturn our initial decision to NOT have a show this year and promised that they would help if we had one, so now is your opportunity to show that you are willing to pitch in! Only about 10 people signed up at the last general meeting on the sheets on the table. Signing up for an hour or two is a small commitment for a single member in an all-volunteer organization such as ours.

Monday ID clinic: The PSMS public ID clinic opened on Monday September 29. Hours are 4-7 pm every Monday until the mushroom season is done.

Field trips: There have been changes to the field trip locations for this fall since last month. To check the most current schedule, please log in to the member's section of the website and click on "Newsletters." Then click on the link to the Fall 2014 field trip insert posted at the top of the page. Note: The field trip schedule is not visible if you do not log into the member's area with your user name and password. To coordinate car pools for the field trips, please sign up on the members-only group list on yahoo at psms-members@yahoogroups.com. You may also post requests there. You may contact me at president@psms.org or Ann Polin at membership@psms.org if you have forgotten your user name. If you have forgotten your password, please use the "forgot your password?" link.

SONG OF THE MUSHROOM KING

The Sporeprint, Los Angeles Myco. Soc.

*I am the Cep—the Mushroom King.
My praises mushroom pickers sing.*

*I am so easy to discover.
I look like me—not any other.*

*I'm very tasty fresh or dry
To you and to the mushroom fly.*

*So pick me when I'm firm and young.
Just finding me is HALF THE FUN!*

— Joe Lenart

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