

SPORE PRINTS

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Number 520 March 2016



EGYPT SUPPLY MINISTRY SEEKS TO CLARIFY POLICY ON ERGOT

Reuters, Jan. 2016
via *The Spore Print*, L.A. Myco. Soc., Feb. 2016

Cairo, Egypt - Egypt's supply ministry moved to clarify rules on wheat imports on Thursday, saying it would allow shipments with traces of the grain fungus ergot to enter the country.

Wheat traders have been concerned that uncertainty over payment and inspection terms in Egypt, the world's biggest wheat importer, would dampen export demand.

The problem surfaced when a cargo of French wheat was rejected last month due to traces of the infection. The supply ministry said on Thursday it would allow shipments of imported wheat with up to a 0.05 percent level of ergot, although this was not enough to quell concern amongst suppliers previously told any level of infection was not acceptable. "It has been decided to keep the percentage as is, without change, after discussions with the agriculture ministry," the supply ministry's spokesman said. The agriculture quarantine authority had previously told Reuters that wheat shipments containing any level of ergot would be barred from entry.

There have since been a series of meetings between officials from both ministries to try to resolve the matter. Wheat traders said they were waiting to hear the agriculture ministry's response to be sure the problem had been resolved. The quarantine authority declined to comment on the supply ministry's statement on Thursday and agriculture ministry officials could not immediately be reached. "Obviously there is a clash between the two ministries so let's wait and see," one Cairo-based trader said.

The General Authority for Supply Commodities (GASC), which falls under the authority of the supply ministry, allowed for a 0.05 percent ergot level under its specifications, but the agricultural quarantine authority had said according to its rules all incoming shipments above zero would be barred.

"We want to wait and hear from the agriculture ministry as that was what was causing the change in the first place," another trader told Reuters.

European and Egyptian traders have told Reuters they would not participate in GASC tenders if new restrictive requirements were applied to GASC tenders.

"If they let the vessel that was rejected pass, this will be like the official announcement of accepting the 0.05 level," a third trader said.



Inset of chromolithograph by W. H. Fitch showing ergot on rye and stroma emerging from sclerotium. From: Berkeley, M. J. 1860. Outlines of British Fungology.

TOXIC MUSHROOM COULD HELP CURE DEADLY DISEASES, NEW RESEARCH REVEALS

Indiatimes.com, Dec. 2015
via *The Spore Print*, L.A. Myco. Soc., Feb. 2016

A team of Michigan State University scientists has discovered an enzyme that is the key to the lethal potency of poisonous mushrooms.

The results show the enzyme's ability to create the mushroom's molecules that harbor missile-like proficiency in attacking and annihilating a single vulnerable target in the human liver. The team unveiled how the enzyme contributes to the manufacture of chemical compounds known as cyclic peptides, a favorite type of molecule that pharmaceutical companies use to create new drugs. These findings could lead to single-minded medicines with zero side effects, said Jonathan Walton, professor of plant biology and co-lead author.

"Mushrooms are prolific chemical factories, yet only a few of their peptides are poisonous," he said.

"These toxins survive the high temperatures of cooking and the acids of digestion, and yet they are readily absorbed by the bloodstream and go directly to their intended target. These are the exact qualities needed for an effective medicine," said Walton.

Working with the mushroom species [sic] *Amanita*, Walton and his teammates disassembled one of its poisonous peptides, which can be compared to a laser-guided missile with a nuclear warhead.

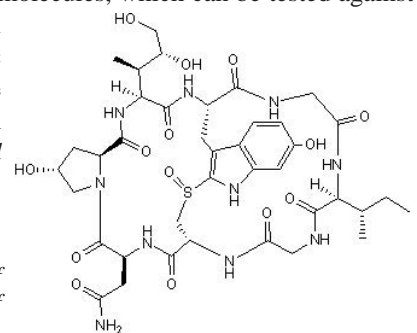
By removing the molecular equivalent of the deadly warhead, they now have a sturdy, precise delivery system that can supply medicine—rather than poison—to a single target.

By taking a laser, rather than a shotgun approach, scientists could develop medicines capable of curing disease without the patient suffering any side effects.

The enzyme the team discovered is called POPB, and it converts toxins from their initial linear shape into cyclic peptides, fortress-like molecular circles comprising eight amino acids.

Harnessing the distinct properties of POPB will allow scientist to create billions of variant molecules, which can be tested against many different medical targets such as pathogenic bacteria and cancer. The study was published in the journal *Chemistry and Biology*.

α-amanitin,
C₃₉H₅₄N₁₀O₁₄S, one of
the many cyclic peptides of
the genus *Amanita*.



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ANNUAL BUSINESS MEETING & SURVIVORS' BANQUET

Marian Maxwell

Saturday, March 5, 7:30 pm (doors open at 6:30 pm), at the Center for Urban Horticulture

Sign-ups are online and seating is limited, so register early to guarantee a seat! The cost is \$5/person, and the banquet is members only. If your significant other or dinner partner is not a member, you can still invite them, but the event is closed to the public because we will have a banquet permit for alcohol. You may bring your favorite wine or beer! No hard liquor!

Our theme for the banquet is "Feast of Fungi!" We encourage you to bring potluck dishes featuring mushrooms. Please label potluck contributions with ingredients and the type of mushroom included, if any.

For the evening, Erin, Brady, and Jamie will introduce and discuss the new PSMS blog, and Daniel Winkler will discuss the proposed Bridle Trails State Park fungi study.

Remember that the banquet on Saturday replaces our general meeting for March. We will present the newly elected board of trustees and officers for 2016-2018, announce the winner of the 2016 Golden Mushroom Award, and have a few door prizes as well. This will be a fun evening with friends and family, so come join us! If you have any questions, you can contact me at outreach@psms.org.



PSMS SURVIVORS' BANQUET

2016



CALENDAR

- Mar. 5 PSMS Survivors' Banquet/Annual Business Meeting, 7:30-9:30 pm, CUH (doors open at 6:30 pm)
- Mar. 21 Board Meeting, CUH Board Room
- Mar. 22 *Spore Prints* deadline

BOARD NEWS

Luise Asif

Therese Boling is the new Field Trip Host Coordinator. James Nowak is working on finalizing details for the All Sound Ben Woo Memorial Foray. It promises to be an exciting event. The Survivor's Banquet/Annual PSMS Meeting is Saturday, March 5. Erin and Brady Raymond will introduce the PSMS Blog to the membership at the banquet. Thank you Erin, Brady, James, and Sweta for all of your hard work to make this happen. Daniel Winkler is finalizing details for PSMS' participation in the Bridle Trails Park Study and will report at the banquet. A call will go out for original member artwork to be used for new club T-shirts. Milton Tam, James Ardena, and James Nowak are busy promoting PSMS through cultivation projects.



NEW FIELD TRIP HOST COORDINATOR

My name is Therese Boling, and I am the new Field Trip Host Coordinator. I grew up in the wilds of Alaska and spent some time in Southern California and Chicago before settling in the Pacific Northwest. By day I read too many books, listen to too much old time radio, and collect too many cats. By night I sleep and dream of books and radio and cats.

I am new to mushroom hunting and PSMS, but have signed on to be the Field Trip Host Coordinator in the hopes of helping out the organization, meeting many great people, and learning more about mycology, plus collecting many delicious mushrooms for kitchen witchery.

I am always looking for field trip hosts! The 2016 field trip agenda will come out with the April issue of *Spore Prints*, and I ask you to please consider volunteering as a host. It's a wonderful way to meet other members and be an extremely important part of PSMS. If you currently have an interest in hosting at some point during the 2016 year, or any other questions about hosting, please email me at victrix@gmail.com.



SWEATING THE SMALL STUFF

David Arora & Wendy So

Mycena News, Myco. Soc. San Francisco, Feb. 2016

There is a local legend here in Zambia about how the Bisa people once lived together in one village. Then during the rainy season one woman found a lot of mushrooms. Neighbors asked for some and she refused. A feud ensued that split the village. A big group of people left to become The Crocodile Clan, while those who stayed with the woman and their descendants were—and still are—called The Mushroom Clan. The mushrooms at the heart of this feud were not eye catchers and headline stealers like *tente* or *chikalowa* (giant amanitas and termite mushrooms), as you might guess. Instead, they are specified as being *samfuwe*—tiny termite mushrooms smaller than *enoki*!

We became friends with a local farmer named Luke who grows coffee but also has his own *samfuwe* farm—inside his house! Once a year, *samfuwe* spring by the thousands from the floors and walls, and also from the outside walls of the house, and in the lawn and garden. As Californians we are conditioned to associating termites with house decay and worried calls to the exterminator. But here, the termites are viewed as providers, not pests.



Samfuwe growing inside Luke's house.

The houses here are made of brick, mud, or stucco, so the termites pose no threat to Luke's house. They feed on woody material from the garden and bring it, partially digested, to the *samfuwe* mycelium growing inside their colonies. This particular kind of termite does not build mounds. Instead, they spread. Their mud casings can be seen inside Luke's house, under the lawn, and in the garden. Luke did not introduce them intentionally—they appeared on their own outside his house and then spread inside.

Luke says, "Our family looks forward to harvesting them every year as they are delicious." Luke carefully watches for the pin heads on the creeping mud casings that the termites make in his house. When he sees the pin heads, he enforces mushroom protection from dogs and people until they mature (1–2 days). Once the mushrooms are ready for harvest, everyone in the house helps collect them. Cleaning them is labor intensive, involving pinching off the ball of dirt at the base of each stem for thousands of mushrooms, then rinsing them. They do this while chatting together, cook some with onions and eggs, and then chill the rest for later use.



Cleaning samfuwe.

We also found *samfuwe* in the garden where we are staying, growing, as usual, in "cities." In southern China, this species is known as "ji zong hua" or "termite mushroom flower" because of its purity and daintiness. You can sometimes see heaps of them for sale in roadside markets. We had a craving for Chinese food so we decided to have them prepared in a traditional Chinese style, i.e., in soup. We emphasized that the tiny whole mushrooms must dominate in quantity. The chef had never prepared them this way but did a spectacular job, using only a cube of vegetable bouillon and bits of onion plus the mushrooms. The sweetness and delicate beauty of the *samfuwe* really shone this way. They had the consistency of bean sprouts but with a burst of sweet mushroom flavor far superior to *enoki*. With sides of whole tilapia and *tente* stew it was one of the most memorable meals of our trip.



Samfuwe soup.

NASA: BLACK MOLD DELAYS ISS RESUPPLY MISSION

Joseph Gibson

<http://perfsience.com/>, Feb. 13, 2016

In an official statement, NASA confirmed that black mold has delayed the mission to resupply the International Space Station (ISS). NASA noticed the black mold on the packing bags that were supposed to be sent to the ISS. This marks the first time in the agency's history when they have had to unload cargo for a transporter to be sterilized.

Dan Hout, official spokesperson for NASA, said that the delay won't be longer than 14 days. As well as ensuring that all the black mold has been removed and the equipment has been sterilized, the US space agency is working on identifying the reason behind the black mold to ensure that such a problem doesn't appear again. The data they possess so far point toward Florida's high humidity levels.

Hout has no idea at present how much the incident will affect the cargo resupply runs planned in coming years with Elon Musk's space transport company SpaceX in partnership with NASA.

PRESIDENT'S MESSAGE

Kim Traverse

Therese Boling has answered the call for a new Field Trip Host Coordinator. Welcome and thank you, Therese!

I am soliciting names for inaugural membership in the Volunteer Guild (if you don't think it should be called that, suggest some other names!). The idea is for this group to include everyone who has ever put in the time as a valued volunteer. Even if it was decades ago, PSMS wants to honor you because you are why we are still doing so well. We have always been an all-volunteer organization, and what that means to me is that we all own the PSMS mission and all the activities and events that we put on every year. We all take our work seriously, and all take responsibility for getting it done. Volunteers are the elite of PSMS, the people who are both hard working and a pleasure to work with. We don't want to miss anyone. Send your suggestions to president@psms.org.

MUSHROOMS ON MONEY

Brian S. Luther

Old German "Notgeld" Banknotes

In 1921–1922 many districts in Germany issued their own banknotes (Notgeld, or emergency money) to deal with the staggering cost of war reparations demanded by the victors of WWI and also because the German Mark during the Weimar Republic was virtually worthless owing to hyperinflation. Some of these notes were good for only a limited time, with an issue date and an expiration date. Those from Bad Harzburg, for example, were good only until December 31, 1922, or a year and a half from the issue date.

Years ago I became aware that some of these banknotes had fungi illustrated on them, so I started collecting them to study. I call these Pilzbanknoten, after Dr. Meixner (1995).

I've been able to find paper banknotes from twelve German municipalities that clearly have mushrooms included in their illustrations, but there could be more I haven't discovered. Those I'm aware of are detailed below, in alphabetical order by town. Although I've photographed all of them, I show only four examples here: one each from Auma, Bevern, Grossbreitenbach, and St. Andreasberg.

Auma *Issue Date, 4/21/1921*

Notes in denominations of 5, 10, 25, and 50 Pfennig and 1 Mark were printed, all with the same design except the 1 Mark note has a different front. All the notes have many mushrooms on the back which appear to be *Boletus edulis* with an elf holding one and sitting on an especially large one. All are signed, but have no serial number. A message says "Auma mushrooms, everyone wants them, seek them out in the Auma forest, that's a thousand years old."

Bad Harzburg *Issue Date, 7/1/1921*

The 10 Pfennig note has five red capped mushrooms on the back. Signed, but no serial number.

Bevern *Issue Date, 12/21/1921*

The 25, 50 & 75 Pfennig notes all have mushrooms on both sides. Signed, with serial numbers.

Blankenhain *No Issue Date Noted*

The 50 Pfennig note shows two reddish mushrooms under the trees, one side only. Signed, with a serial number.

Braunschweig *7/1/1921*

The 25 Pfennig note shows three mushrooms in the lower left hand corner on one side. No signature or serial number.

Brocken *Issue Date, 7/1/1921*

The 10 Pfennig note has 7 reddish mushrooms on one side. Signed, but no serial number.

Grossbreitenbach *No Issue Date Noted*

The 50 Pfennig note has three mushrooms on the top right panel under a woman carrying a load through the forest. Signed, but no serial number.

Königssee *Issue Date, 1/1/1921*

The 10 Pfennig note has some mushrooms on the ground under an elf. Signed, with a serial number.

Kreis Ballenstedt *Issue Date, 8/27/1921*

The 50, 75, and 100 Pfennig notes show reddish capped mushrooms that appear to be boletes on the back sides. Signed, with serial numbers.

Oberheldringen

Issue Date, 8/27/1921

The 50 Pfennig note has two red capped mushrooms on one side. Signed, but no serial number.

Prisdorf

No Issue Date Noted

The 25 Pfennig note has numerous black outlined mushrooms under the trees. Signed, with a serial number.

St. Andreasberg

Issue Date, 8/27/1921

The 25 Pfennig note has two mushrooms in the lower right corner on one side. Signed, with a serial number.



Auma 1921 - back side of 1 Mark note. Message says "Auma mushrooms, everyone wants them, seek them out in the Auma forest, that's a thousand years old."



Bevern 1921 - back side of 25 Pfennig note showing two mushrooms.



Grossbreitenbach - back side of 50 Pfennig note showing three mushrooms.



St. Andreasberg Notgeld with two mushrooms.

I have discussed the subject of fungus-illustrated paper ephemera previously (Luther, 2012).

German Notgeld Coin

I'm presenting to you a rare German 10 Pfennig (10 cent) Notgeld coin issued in 1920 from the municipality of Schoenwald in Bavaria (close to the Czech Rep.), showing two conifer trees with two mushrooms in between on one side. As with the paper Notgeld mentioned above, an enormous number of Notgeld coins were also issued for the same reason by many areas of Germany between 1915 and the 1920s. The coin shown here is solid zinc, 20.1 mm in diameter—basically the same size as a US nickel, but much thinner. Both the trees and the mushrooms are embossed, or slightly projecting from the coin surface. Close examination of the mushrooms under magnification indicates they have some gills under the caps, but are otherwise simply stylized, lacking distinguishing features for any known species.



1920 Schoenwald 10 Pfennig zinc coin. Funck Cat. No. 486.5a.

Flip side of Schoenwald 10 Pfennig coin showing two trees and two mushrooms.

The coin is a dull tarnished gray overall, which is typical for an old piece of zinc or any galvanized (zinc coated) item. I considered cleaning it by various methods described in the literature, to see if that would improve how it looked, but ultimately was concerned it would dramatically change the original 96-year-old patina, so I abandoned that idea. Even though I'm not interested in coin collecting, I'll have to admit this is an extremely unique and unusual item for anyone seriously interested in genuine old objects depicting fungi. FYI, the town of Schoenwald is located in the Black Forest and has the distinction of being where the first Cuckoo clocks were invented and made, around 1737.

I'm also aware of an earlier Notgeld coin from Schoenwald issued in 1918 with a value of 1 Pfennig which has a similar, but slightly different design and is made of iron (Funck Catalog #486.1). According to Meixner (1995) there may be other Notgeld coins with mushrooms as well, which I'm actively searching for.

New Zealand Paper Money

New Zealand is part of Polynesia and has a couple of \$50 bills (the first issued in 1990) on which the reverse sides show an endemic and endangered bird called the Kokako, as well as two basidiocarps of *Entoloma hochstetteri*, a brilliant blue native mushroom found there. Only the bird is identified with a name. The first two images below were copied from the Reserve Bank of New Zealand's website at <http://www.rbnz.govt.nz/news/2000/0088734.html>.

The website refers to this fungus as the "Sky-blue mushroom." In real life the inside of the oval area you see on the right front is actually totally transparent (it's a clear material like plastic, which I've never seen on money before and has a faint 50 on it). There's a newer high-security version of this bill (2015–2016) that also has two of the same mushroom species, but the mushrooms are located on the left side (back) with the bird to the right.

The last image showing the back of this newest NZ \$50 bill was copied from Google. So, it looks like New Zealanders appear to have more mushrooms in their wallets and purses than any other people on earth.



Front (top) and back (bottom) of earlier NZ \$50 bill.



Back of newer NZ \$50 bill.

Solomon Islands Paper Money

The Solomon Islands are part of Melanesia (which also has two \$50 bills showing mushrooms). The back side of the earlier bill (1986, 1996, 2001, 2005, 2009) shows seven creamy-yellow mycenoid mushrooms in a caespitose clump on wood. The newer bill, issued in 2013, has the same illustration of mushrooms on the back, but they're whitish, not creamy yellow, and in a slightly different position; also the art work was changed so that the endemic Solomon Islands Skink is blocking the view of one of the caps, so you can only see six of the seven mushrooms.



Close up of earlier Solomon Islands \$50 bill with mushrooms. Unlike the most recent bill, all the mushrooms are visible because the Skink is not blocking any.

cont. on page 6.



Solomon Islands newer \$50 bill with one mushroom cap not visible.



Close-up of mushrooms on newer Solomon Islands \$50 bill. On this newer bill, one mushroom is blocked by the head of the Skink.

There could be other examples of paper money showing mushrooms, but so far I've only found examples from NZ and the Solomon Islands.

References

Luther, Brian S. 2012. An Introduction to Fungus-Illustrated Cinderellas. *Spore Prints* 486 (November), pp. 6–7. Online and in color at www.psms.org

Meixner, Dr. GMBH. 1995. *Pilzbriefmarken aus aller Welt und andere Pilz-Sammelobjekte*. Catalog privately printed and distributed, Stuttgart, 20 pp.

HIGHLY PRIZED CATERPILLAR FUNGUS DECLARED A DANGER TO HEALTH BY CHINA'S FOOD AND DRUG ADMINISTRATION Alice Yan

Scmp.com, Feb. 2016
via *The Spore Print*, L.A. Myco. Soc., Feb. 2016

Products derived from rare ingredient from Tibet found to contain up to 10 times the national limit of arsenic, officials say.

Cordyceps, or caterpillar fungus, one of the most sought after and expensive ingredients in traditional Chinese medicine, has been deemed a danger to human health by China's main food and drug regulator, mainland media report.

A recent examination by the State Food and Drug Administration showed that products derived from the fungus, such as powders and tablets, contain excessive arsenic, Chinanews.com reports.

The national standard limit for the toxic chemical is 1 milligram per kilogram, but the level found in the supplements ranged from 4.4–9.9 mg/kg.

Consuming the products over a long period increased the risk of the element, a common poison, accumulating in the body, the authority said.

AREAS THAT HAVE VALLEY FEVER FUNGUS EXPANDED TO INCLUDE YAKIMA COUNTY

Rita R. Robison
Seattle PI, Feb. 10, 2016

[abridged] For the first time, soil and dust samples from Yakima County have tested positive for *Coccidioides immitis*, the fungus that causes Valley Fever. Samples from several sites in Benton County previously tested positive for the fungus.

People who inhale the fungus from soil can develop coccidioidomycosis, known as Valley Fever. Most people who are exposed to the fungus never have symptoms. Other people may experience symptoms such as fever, fatigue, cough, shortness of breath, headache, and body or joint aches, night sweats, or a rash which usually go away on their own after a few weeks. Less common are more severe developments including meningitis, bone or joint infections, skin lesions, or chronic pneumonia.

Preventing Valley Fever is difficult, since anyone who breathes the air where the fungus is present can be infected. The best way to protect yourself is to know the symptoms of Valley Fever, and if you have them ask your doctor to test you.

Since 2010, nine human cases of Valley Fever have been reported from the following counties: Yakima, 4; Benton, 3; Franklin, 1; Walla Walla, 1.

MUSHROOMS ON THE TABLE

Dick Sieger

Next time you're in the historical center of Melaka, Malaysia, stop in the Cheng Ho restaurant on Tukang Besi Street for a fine vegetarian meal and cool off with a few bottles of Tiger beer. (The toilet is upstairs past the life-size fiberglass giraffe.)

And while you are there, take a look at the mushrooms growing from the table in the atrium, which is open to the sky and its frequent rains. The mushrooms are beautiful, big, off-white perennial polypores. "Polypores" should have "many pores," but the underside of these have gills—white gills in two tiers with no cross walls, just like some ordinary agarics. Curious.

The restaurateur attributes their occurrence to roosting birds. He nurtures them by pouring water on them, so he probably will keep them there until his table crumbles. Good man.



CALTRANS ORDERED TO PAY \$12 MILLION FOR CONSTRUCTION CREWS' EXPOSURE TO FUNGUS

Equipmentworld.com.
via *The Spore Print*, L.A. Myco. Soc., Feb. 2016

The California Department of Transportation has been ordered to pay close to \$12 million to five contracted construction employees for exposing them to a dangerous fungus.

According to the *Los Angeles Times*, a jury in Solano County ruled that Caltrans knew there was a dangerous fungus, *Coccidioides immitis*, that causes an incurable respiratory disease known as Valley Fever, at the Kern County jobsite where crews were expanding a culvert in 2008.

The fungus is present in the soil. When the earth is disturbed, the spores can easily be breathed in.

The jury found that the DOT knew the risks of the fungus, and even had a map from the county health department that showed where the fungus is located.

"They weren't advising people of the risk that they would get an incurable disease," lead attorney Alfert said. "On a real, common-sense level, the case came down to the fact that it was clear that Caltrans knew about the risk. They warned their own people about the risk. It would be so easy to warn the plaintiffs about this."

The fungus exposure has left two of the five construction workers disabled and unable to work. Two more of the workers are not fully disabled but do require accommodations as a result of the exposure. The final worker didn't have as much contact with the fungus and has returned to work after a less severe infection.

ANTARCTIC FUNGI COULD SURVIVE ON MARS, ISS STUDY SHOWS

Ravi Mandalia
<http://www.dispatchtribunal.com/>, Feb. 7, 2016

In a find that will help with the search for life on Mars, researchers have shown that Antarctic fungi could survive on conditions akin to those on the Red Planet.

The findings are the result of a study wherein European scientists gathered tiny fungi from Antarctic rocks and sent them to the International Space Station (ISS) to find that 18 months after being on board the space station in conditions similar to those on Mars, more than 60 percent of their cells remained intact, with stable DNA.

The conditions on McMurdo Dry Valleys, located in the Antarctic Victoria Land, are considered to be the most similar earthly equivalent to Mars, with the region being one of the driest and most hostile environments on our planet, where strong winds scour away even snow and ice. Only so-called cryptoendolithic microorganisms, capable of surviving in cracks in rocks, and certain lichens can withstand such harsh climatological conditions.

A team of European scientists traveled to this remote place and retrieved samples of two species of cryptoendolithic fungi: *Cryomyces antarcticus* and *Cryomyces minteri*. The team then sent samples of this tiny fungi to the ISS by placing them in cells (1.4 cm in diameter) on a platform for experiments known as EXPOSE-E, developed by the European Space Agency to withstand extreme environments.

The platform was sent in the Space Shuttle *Atlantis* to the ISS and placed outside the *Columbus* module with the help of an astronaut from the team led by Belgian Frank de Winne.

The samples were exposed to Mars-like conditions for 18 months with an atmosphere with 95 percent carbon dioxide, 1.6 percent argon, 0.15 percent oxygen, 2.7 percent nitrogen, and 370 parts per million of water, and a pressure of 1,000 pascals. Through optical filters, samples were subjected to ultra-violet radiation as if on Mars (higher than 200 nanometers) and others to lower radiation, including separate control samples.

"The most relevant outcome was that more than 60 percent of the cells of the endolithic communities studied remained intact after 'exposure to Mars,' or rather, the stability of their cellular DNA was still high," highlights Rosa de la Torre Noetzel from Spain's National Institute of Aerospace Technology (INTA), co-researcher on the project.

The scientist explains that this work, published in the journal *Astrobiology*, forms part of an experiment known as the Lichens and Fungi Experiment (LIFE), "with which we have studied the fate or destiny of various communities of lithic organisms during a long-term voyage into space on the EXPOSE-E platform."

"The results help to assess the survival ability and long-term stability of microorganisms and bioindicators on the surface of Mars, information which becomes fundamental and relevant for future experiments centered around the search for life on the Red Planet," states De la Torre.

LACE LICHEN NAMED CALIFORNIA'S NEWEST STATE SYMBOL

Emily Benson
Marin Independent Journal, Feb. 16, 2016

California's newest state symbol adorns coastal oaks and conifers like a cloak. Birds pluck it from the branches to line their nests. Deer find it so delicious they've been known to fight over it. Scientists study it for clues about air pollution.

And now, California has turned it into the country's first official state lichen.

This year, lace lichen (*Ramalina menziesii*) joined the ranks of the Golden State's 36 other official state symbols, which range from the California grizzly bear, the official state animal, to the saber-toothed cat, the official state fossil.



Lace lichen, *Ramalina menziesii*.

TESTS SHOW POWDERY MILDEW FUNGUS EVOLVES VERY RAPIDLY

Ann-Marie Jeffries

<http://www.growingproduce.com/>, Feb. 18, 2016

[abridged] Researchers at the University of California-Davis have made some recent discoveries that could help combat one of the most-prevalent grapevine diseases: powdery mildew.

In 2013, the researchers sequenced the genome of the powdery mildew fungal pathogen *Erysiphe necator* and learned how the species evolves in response to fungicide treatments. They collected several strains of the fungus from vineyards throughout California that were treated with fungicides, as well as those that were not treated. The genomes of all the strains were sequenced, and it was discovered that a fungicide-resistance mechanism was present only in vineyards where chemical fungicides were used.

“Affected strains of the...species are very, very different genetically—much more different than humans are from each other—which suggests that the fungus evolves extremely rapidly,” says UC-Davis Department of Viticulture and Enology Associate Professor Dario Cantu. “This is an important implication in how we deal with it.”

Gastón Guzmán

1932–2016

We would like to acknowledge the passing of Gastón Guzmán of a heart attack in Guadalajara, Mexico, on January 12, 2016, at the age of 83. One of the world’s greatest authorities on the genus *Psilocybe*, Guzmán was a renowned mycologist and anthropologist. He was the author of nine books and over 350 papers on Mexican mushrooms, and he described more than 200 new taxa of fungi worldwide. Over half of the known psilocybin mushroom species were discovered by Guzmán.



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page 8

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