SPORE PRINTS

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STUDENT GROWS A MUSHROOM CANOE

Sarah Kuta
https://news.yahoo.com/, Apr. 18, 2020

Catch a glimpse of Katy Ayers paddling her canoe on a Nebraska lake this summer and you might do a double take.

At first glance, her 8-foot vessel looks much like any other canoe—same oblong shape, same pointed ends, same ability to float on water.

But upon closer inspection, it's clearly anything but ordinary: Ayers' canoe is made out of mushrooms.

More specifically, her boat is made from mycelium, the dense, fibrous roots of the mushroom that typically live beneath the soil. Ayers, 28, a student at Central Community College in Columbus, Nebraska, even gave her creation a fitting name: "Myconoe."

Katy Ayers

"*Myconoe.*" *Katy Ayers' 8-foot vessel made from mycelium, the dense, fibrous roots of mushroom that typically live beneath the soil.*

Though Ayers has taken the canoe out for several quasi-recreational excursions—and plans to do so again as soon as the weather warms up in the rural part of Nebraska where she lives—her real goal with the eye-catching project is to raise broader awareness about mushrooms. She is part of a growing movement of mushroom advocates, people who believe these squishy, sometimes edible fungi can help solve some of our most pressing environmental problems.

In addition to their ability to break down harmful pollutants and chemicals, Ayers pointed out that mushrooms can be used for everything from household insulation to furniture to packaging, replacing plastics, Styrofoam, and other materials that are hard to recycle and harmful to the environment.

"Mushrooms are here to help us—they're a gift," Ayers said. "There's so much we can do with them beyond just food; it's so limitless. They're our biggest ally for helping the environment."

Mushrooms aren't exactly mainstream, though citizen scientists like Ayers and some private companies hope to someday change that. The New York-based biotech company Ecovative Design, for instance, has made headlines for its mushroom-based packaging material, which has been deployed by companies such as Ikea and Dell. Mushrooms are being used at the local level to help clean up toxic debris and contaminated soil—a process known as mycoremediation—but so far have not been adopted on a larger scale.

Ayers never paid much attention to mushrooms until she enrolled in 2018 at the college in Columbus, a small city with around 23,000 residents. During her first semester, an English instructor challenged students to find and study a potential solution to climate change.

During her research, Ayers came across a 2013 documentary called "Super Fungi," which made the case for mushrooms as an environmental ally and highlighted some of their innovative uses.

Ayers was sold on the power of mushrooms instantly. Having learned that mycelium is buoyant and waterproof, she decided to try using it to create a boat.

"I always have very big ideas," she said. "So I see something and it's small and I just want to make it bigger and better. Since I'm from Nebraska, I love to fish. I've always wanted a boat. Why not just grow it?"

With a mini-grant from the college, Ayers got to work. She reached out to a mushroom company in nearby Grand Island for help, sharing her idea with owner Ash Gordon. He agreed to help immediately and offered her a summer internship so she could learn the ins and outs of fungi.

During the day, Ayers worked alongside Gordon at Nebraska Mushroom, doing lab work, creating spawn, and harvesting, packaging, and processing mushrooms.

After finishing their work for the day, the two turned their attention to the canoe project. They first built a wooden skeleton and a hammock-like structure to suspend the boat-shaped form in the air.

They next sandwiched the boat's skeleton with mushroom spawn and let nature take over.

For two weeks, the fledgling canoe hung inside a special growing room in Gordon's facility, where temperatures ranged between 80 and 90 degrees and the humidity hovered between 90 and 100 percent. The last step in the process was to let the 100-pound boat dry in the Nebraska sun.

Katy Ayers

Myconoe during construction.

All told, Ayers said she spent $500 on spawn, tools, and equipment to build the canoe.

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CALENDAR

May 12 Membership meeting, 7:30 pm (virtual meeting via Zoom)

May 18 Board meeting, 7:30 pm (virtual meeting via Zoom)

BOARD NEWS — Luise Asif

Kudos to Marion Richards and her group for making the online April membership meeting such a success. As expected, the May membership and board meetings will also be held online. For the May membership meeting, Marion is working with Rick Van de Poll on the protocol he prefers to use. Once it is established, members will receive information on how to join the presentation. Reluctantly Mushroom Maynia for this year is cancelled. Plans are under way to compensate lack of field trips with online programs. Be sure to regularly check your email in boxes for PSMS updates and new offerings. A reminder that PSMS has Ben Woo Scholarship funds available for fungal research; deadlines are March 1 and September 1. The board gave out its first 2020 award for the study "Characterizing ectomycorrhizal fungal community composition along a nitrogen gradient within a salmon stream system."

MEMBERSHIP MEETING

Tuesday, May 12, 2020, at 7:30 pm.*****

Our speaker is Dr. Rick Van de Poll, and his topic is "Squamanita: Chasing A Fungal Sasquatch."

Dr. Van de Poll.

Rare fungi are rare, aren't they? Or is it that we just don't know when and where to look for them? Dr. Van de Poll's overview of uncommon to hypothetical species in North America will test your familiarity with lesser known fungi, as well as solicit your help in constructing a regional list of rare fungi. Through his examination of field collection records for North America, Van de Poll will review and describe a select list of 25 rarely encountered fungi. With an eye toward a North American "Red List," an emphasis will be placed on boreal and sub-boreal species whose range and occurrence may be threatened by a warming climate.

Dr. Van de Poll is the principal of Ecosystem Management Consultants of Sandwich, New Hampshire. He has taught mycology at the undergraduate and graduate level for over 25 years. He has been on the faculty the Northeast Mycological Federation (NEMF) since 1996, when he co-chaired the joint NAMA/NEMF Foray at Mt. Ascutney. He is currently the president of NEMF and the Sandwich Area Mushroom Club.

***Note:** As in April, this will be a virtual meeting conducted on Zoom. Members will need to register ahead of time. A link and a password to the meeting will be sent to the email address given in your registration within an hour before the meeting.

A DIFFERENT SPRING THIS YEAR
Randy Richardson, PSMS President

The board has again cancelled the upcoming meeting at CUH as well as plans for Mushroom Maynia. We are trying to replace some lost activities of the club, however, including working to have an online speaker, with final news on that then sent to members.

This Covid world forces change, some of which can be uplifting or humorous, if we can remain open despite the stress. One PSMS member has started a GoFundMe to help a friend get excess food delivered to those in dire straits. Others sew face masks for retirement homes, do gardening, or, for me, walk to a nearby park and pull invasives. As unpleasant as it is, other parts of the world are worse. Those who do still work ("essential") have easy commutes. We can pause to focus on some of the small but meaningful things that make up our lives, like getting in touch with people we never seem to find time for normally. And some people use the time to be creative, with humor, from music—"Stayin' Inside" on YouTube, "Don't Stand So Close To Me" by Newcastle Police Department—to art (recreate paintings), and of course lots of animal pictures (UPS dogs).

Stay well, and we will hope to be together before too long.

BEN WOO FORAY, Part II, Presenters and Workshops

Luise Asif

PSMS is still hoping that the 2020 PSMS Ben Woo Memorial Foray will happen.

Friday, October 9, thru Sunday, October 11
Note change in fees!
$180/person for PSMS members
$185/person for PSMS guest members
Registration opens middle of June
Space is limited to 100 foragers
PSMS members or PSMS guest members only

Presenters

Friday evening we willl hear from Steve Trudell, Ph.D., mycologist and co-author of *Pacific Northwest Mushrooms*, topic to be determined, followed by Alana McGee, truffle expert and owner of The Truffle Dog Company, topic to be determined. Saturday Marian Maxwell, former PSMS president, will enlighten us about the amazing "Role of Fungi in the Ecosystem." Finally Daniel Winkler, former PSMS vice president and worldwide MushRoaming travel tour guide, will captivate and intrigue us with images of "Fungal Friends and Foes."

Workshops

We are excited to offer several informative hands-on workshops. Advanced registration is required. Workshops take place on Saturday; below is a list of this year's workshops. When signing up for afternoon workshops keep in mind that they all happen concurrently so sign up for only one afternoon workshop, unless you have your avatar with you! The cultivation workshop is scheduled before lunch so everybody can attend except those going out on a chanterelle foray.

Cultivation Workshop

Saturday, October 10
11:00 am to 12:00 pm
Cost $6
No limit on attendance

Milton Tam, Ph.D., PSMS cultivation chair, will lead the mushroom cultivation workshop. This workshop will include a PowerPoint presentation to provide supportive information. Then participants will make their own oyster mushroom "patches" to take home. Milton will be there to guide you through his unique non-sterile process. So much fun and so easy!

Cooking Workshop

Saturday, October 10
1:00 pm to 5:00 pm
Cost $35
Limit 20

Master chef Chad Hyatt, author of *The Mushroom Hunter's Kitchen*, will expand your awareness of culinary mushrooms and share unusual and flavorful recipes from his book. You will have the opportunity to work directly with Chef Hyatt creating unique preparations to add to your quiver of recipes. Open to all levels of cooking experience. Roll up those sleeves and be prepared to cook up a storm.

Bon appétit!

Microscopy Workshop

Saturday, October 10
1:00 pm to 5:00 pm
Cost $35

Kim Traverse, an expert in microscopy, will reveal the fascinating world of mushrooms as seen through the lens of a microscope, so useful for identification and for viewing fascinating fungal structure. This is a rare opportunity to work with PSMS's brand new, state-of-the-art microscopes. No prior experience necessary.

Mushroom Dye Workshop

Saturday, October 10
1:00 pm to 5:00 pm
Cost $35
Limit 20

Marion Richards will guide you through the fascinating process of dyeing fabric using mushrooms. Each participant will receive one silk scarf to dye during the class as well as a sample card that will be created from woolen yarn samples dyed during the demonstration. Additional scarves available for purchase for $10. Experience another incredible aspect of mushrooms in this "to dye for" workshop.

Next month coming in this space: list of Ben Woo Foray field trips and leaders.

FAIRY RINGS BRING LIFE—AND DEATH—TO ECOSYSTEMS

Linh Anh Cat

https://www.forbes.com/, Apr. 11, 2020

Fairy rings are naturally occurring circles or arcs formed by mushrooms. In different cultures, they are thought to bring either death or growth.

Fairy rings can be found in forests, grasslands, or even your front yard.

Depending on the species of fungus growing, the fairy ring is sometimes surrounded by dead grass or is either proceeded or followed by rapid growth of the grass above it. This may explain why fairy rings can be associated with either death or growth.

There are just over 60 species of fungi that grow into fairy rings. The oldest fairy rings are thought to be hundreds of years old. One fairy ring in France spans over 2,000 feet in diameter and is thought to be over 700 years old.

Scientists based in Italy released a new study this week on fairy rings and how they alter the ecosystems they appear in. The study focused on *Agaricus arvensis*, which forms fairy rings in Mediterranean grasslands with many plant species.

In the mountains of central Italy, the scientists focused on the outside edges encompassed by the fairy ring. They picked fairy rings that were about 30 to 40 feet in diameter. The fairy rings in this region expand about two feet each year. The scientists found that as the fairy rings spread, they decreased the diversity of plant and microbial species that were found before, promoting the growth of certain species over others.

Ancient lore is right: fairy rings bring both life and death.

ERGOT

Dick Sieger

Ergot, *Claviceps purpurea*, infects grasses, especially those cultivated for food—rye, barley, and wheat. It is fond of unusually cold winters followed by wet springs. In summer and fall its inky horns show up on the heads of grain scattered among the healthy seeds. These horns, called sclerotia, are hard masses of fungal material that fall to the ground and overwinter. In the spring, tiny stalks with pale pimply heads called stromata develop on them and produce ascospores to infect the new grain crop. These spores are greatly elongated, up to 120 microns in length but less than a micron in diameter.

Ergot is poisonous for cattle and people. It produces powerful alkaloids including LSD, a hallucinogenic drug known as "acid." In the Middle Ages, and even as late as 1951, ergotism, called St. Anthony's Fire, made life a dreadful misery for large populations of people who ate poor quality bread made from infected rye flour. In less enlightened times, women used it to induce abortion when no legal methods were available. LSD is fairly common as a recreational drug and is now being investigated as a treatment for a range of physical and mental maladies.

Claviceps purpurea can be found in most temperate regions around the world. I've seen the sclerotia on volunteer rye in eastern Washington and on grass in a vacant lot in Seattle.

Claviceps purpurea life cycle. **a.** Sclerotia on head of rye. **b.** Perithecial stromata arising from sclerotium. **c.** Section through head of stroma with perithecia. **d.** Ascus with ascospores. **e.** Mature ascospores.

NEUROSCIENTISTS UNCOVER HOW MAGIC MUSHROOMS "REBALANCE" THE BRAIN

Emma Betuel

https://www.inverse.com/, Apr. 13, 2020

There's no reset button on your brain. But the more scientists learn about magic mushrooms, the more we know that they're about as close to a reset button as we can get.

Psilocybin—the hallucinogenic chemical in certain mushrooms—can reshape cells in the brain, and increasingly shows potential for treating addiction or depression. Now, using new brain models, scientists are getting a better idea of how it all happens.

Scientists constructed a model of the human brain on psilocybin, illuminating how magic mushrooms allow our brains to access untapped potential. This model shows that, under the influence of psilocybin, the brain creates a feedback loop of neuron activity and neurotransmitter release (the chemical messengers that neurons use to communicate).

That dynamic creates a one-two punch that could allow the brain to tap into otherwise inaccessible states, including the "destabilization" of individual brain networks and the creation of a more "global" network across the brain.

That destabilization is one hypothesis that scientists have used to explain why magic mushrooms can create psychedelic experiences. But it could also underscore why they have potential as treatment for disorders like depression, explains Morten Kringlebach, the study's first author and a senior research fellow at the University of Oxford.

"Using this model will be crucial for truly understanding how psilocybin can rebalance neuropsychiatric disorders such as treatment-resistant depression and addiction," Kringlebach tells *Inverse*.

This finding was published Monday in *Proceedings of the National Academy of Sciences.*

How Do Magic Mushrooms Affect The Brain?

This study is based on brain images taken from nine participants who were either injected with psilocybin or a placebo. The scientists used those images to create a "whole-brain connectome" which provides a picture of all the physical neurons in the brain, as well as the activity of the neurotransmitters that are being shuttled back and forth.

During your average day in the human brain, neurons are constantly firing and neurotransmitters are traveling well-trodden paths through the brain, somewhat like cars on a freeway. On magic mushrooms, those networks are "destabilized," Kringlebach explains.

Previous research has shown that new networks appear in tandem. It's as if those cars on the freeway were given free rein to stray from the highway and take back roads towards new destinations.

Scientists are beginning to understand how this works. For instance, psilocybin (as well as psychedelics like DMT) mimic serotonin, a neurotransmitter related to feelings of happiness or love. Kringelbach suggests that these mushrooms do more than simply affect serotonin flow in the brain.

"We wanted to investigate the role of neurotransmission in dynamically changing the activity in whole-brain networks—and how this changes neurotransmitter release in return," he explains.

The models showed that the brain is able to tap into new networks by coupling the effects of neuron activity *and* the release of neurotransmitters, like serotonin. The release of neurotransmitters and the firing of neurons work together—and when you have one without the other, the whole system falls apart.

When the scientists adjusted their model to have these processes work independently, they found that they weren't able to recreate the same "destabilization" of networks that you would usually see when someone is on magic mushrooms. The same breakdown in their pattern happened when they replaced the typical serotonin receptors utilized by magic mushrooms (5-HT2A receptors) with other types of serotonin receptors.

Taken together, this suggests that *both* the receptors themselves, *and* the patterns of neuron activity are necessary for psilocybin to really work.

The Future of Magic Mushrooms

Knowing that both receptors and neuron activity are needed, says Kringlebach, could help better understand how to use the drug as a therapy. In turn, these models can help us visualize an enduring mystery within the human brain, says Kringlebach.

"It has long been a puzzle how the brain's fixed anatomical connectome can give rise to so many radically different brain states, from normal wakefulness to deep sleep and altered psychedelic states," he says.

We only have a fixed amount of hardware in the brain, yet we're running highly complicated software that produces dreams, consciousness, and—if someone is on a drug like DMT—"breakthrough experiences."

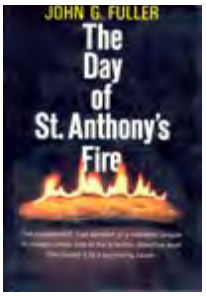
If the magic mushrooms demonstrate anything, it's that the brain can learn to use its fixed hardware in very different ways, if the right ingredients are involved. The trick is figuring out what tools the brain needs to run different types of software on that hardware.

In the future, the team hopes that their model could help us learn how we can run different types of software in our brains, and in doing so, help treat conditions like depression.

"This new model will give us the much needed, causal tools for potentially designing new interventions to alleviate human suffering in neuropsychiatric disorders," Kringlebach says.

THE DAY OF ST. ANTHONY'S FIRE

Blurb fromthe jacket of The Day of St. Anthony's Fire, *John C. Fuller, The Macmillan Company, New York, 1968.*



This is the strange, true, yet almost incredible story of a small French village where in 1951 hundreds of respectable townspeople went totally mad on a single night. Many of the most highly regarded citizens leaped from windows or jumped into the Rhone, screaming that their heads were made of copper, their bodies wrapped in snakes, their limbs swollen to gigantic size or shrunken to tiny appendages. Others ran through the streets, claiming to be chased by "bandits with donkey ears," by tigers, lions, and other terrifying apparitions.

Animals went berserk. Dogs ripped bark from trees until their teeth fell out. Cats dragged themselves along the floor in grotesque contortions. Ducks strutted like penguins. Villagers and animals died right and left.

Piece by piece, the story behind the tragedy in Pont-St.-Esprit—a tiny Provincial village of twisted streets that looks today much as it did in the Middle Ages—unfolded to the doctors, the *gendarmerie,* and the toxicologists. That story, one of the most bizarre in modern medical history, is movingly and brilliantly recounted in *The D*ay *of St. Anthony's Fire.*

Throughout the Middle Ages, and during other times in history, similar hallucinatory outbreaks had occurred. They were called St. Anthony's Fire because it was believed that only by prayers to this saint could the disease be held in check.

Even modern medicine could find no way to check the disease. Drugs failed to bring even temporary relief. Hundreds in the village suffered for weeks with total and agonizing insomnia, never knowing when they might once more suddenly go berserk.

The cause of St. Anthony's Fire was known since early history to be ergot, an Ascomycete (*Claviceps purpurea)* found on grain that at rare times inexplicably became poisonous enough to create monstrous hallucinations and death. In 1951 little significance was attached to the fact that the base of ergot was lysergic acid, also the base for LSD, a drug just coming to the attention of scientists at that time—a drug so powerful that one eye dropperful could cause as many as 5,000 people to hallucinate for hours. At this point, *The Day of* St. *Anthony's Fire* becomes a vivid and absorbing medical detective story demonstrating the possibility that a strange, spontaneous form of LSD might have caused the irreversible human tragedy that came to the hapless villagers of Pont-St.-Esprit.

Mushroom Dance

Dancing on the mushrooms
Jumping on their hats
We are the faeries of the night
You can't see us if there's light

Can you see us as you're passing by?
We like to see our shadows when we dance
But only by candlelight!
We are the faeries of the night

And before daylight comes ....we're gone!
And though you'll never in this lifetime see us twice
You'll always remember us with an enchanted sigh
Dancing on the mushrooms at night
By candlelight!

—Daphne

Morels! Morels!

The musical sound
The more you look
The more will be found
The more you find
The better you feel
so eat more morels
in every meal
—Eva Villanueva

Mushroom canoe, *cont. from page 1*

Ayers, who displayed her "Myconoe" at the 2019 Nebraska State Fair, has taken the canoe out for three test floats, including one in which two people comfortably sat inside. The boat is still alive, which means it fruits—grows mushrooms—each time they take it out for a paddle.

The successful mycelium canoe inspired Ayers and Gordon to experiment with making chairs, landscaping bricks, and other items.

Though it started as a hands-on learning opportunity for Ayers in the course of her collegiate studies, the canoe has also served as a quirky conduit for conversations about mushrooms.

"It's not just a piece of art, this is a functioning boat that works," Gordon, 39, said. "It really helps bridge that gap between people who didn't have an interest in mushrooms—maybe they don't like to eat mushrooms and really haven't thought about other potential uses for them. The boat gave them something to look at and think about."

Now Ayers is sharing her newfound fungi fabrication knowledge with other students at the community college. She's part of Growing Pathways to STEM, a full-ride scholarship program funded by the National Science Foundation that aims to help low-income and underserved undergraduates studying science, technology, engineering, and math.

Ayers is leading one of the cohort's main research projects: building bee hotels, small structures also called nests or homes, from mycelium.

Katy Ayers

Katy Ayers paddling her mushroom canoe on a Nebraska lake.

IT'S YARSA-PICKING TIME **Alton C. Byers**

Nepali Times, March 20, 2020

The yarsa gumba harvesting season this year coincides with the coronavirus scare, and as rumors spread about its supposed medicinal properties, there could be a run on the over-extracted Himalayan fungus this year.

Furthermore, with the spring trekking season wiped out by the COVID-19 epidemic, local people dependent on tourism income will now have to fall back on earnings from a fungus that fetches high prices across the Himalaya in China.

The highest-quality yarsa can fetch up to $70,000 per kilogram in China, and its collection each mid-May to mid-July can account for between 65 percent and 100 percent of a picker's annual income. But the profits can be both a blessing and a curse.

The additional income helps pay for food, education, support for aging parents, and donations to local monasteries. But the harvest season also brings an influx of tens of thousands of people each spring to Nepal's fragile alpine ecosystem in a stampede that looks like a gold rush.

Whole hillsides of slow-growing juniper are cut each year for fuel in Dolpo and Tibet, and there has been an increase in wildlife poaching, litter, garbage, and free-range defecation. There has also been an increase in alcohol and drug consumption, conspicuous consumerism, the loss of traditional cultural values, violence, and even occasional murders.

But here in the Barun Valley the impact of the yarsa season is more benign due to closer engagement of the local community. The Barun is a beyul, a sacred valley blessed by Guru Rinpoche in the 8th century as a refuge for the faithful in times of stress. The landscape is dominated by the spectacular rock face of Shiva Danda, where three caves look like the eyes and nose of Lord Shiva. Each summer, pilgrims undertake the difficult and dangerous rock climb to the caves.

Nepali Times

Mt. Makalu (8,485m) towers over the sacred Seto Pokhari glacial

There is also a pigmented cliff at Riphuk which pilgrims believe is a painting of a snow leopard by Guru Rinpoche. Ama Buchung is a rock massif in the shape of a pregnant woman, known for granting the gift of children to the devout. There is also the sacred Seto Pokhari glacial lake near Mt. Makalu base camp.

The main difference between the yarsa harvesting season in the Barun and in western Nepal is terrain. While much of the yarsa in Dolpo are on rolling high-altitude meadows, in the Barun the fungus grows upon precipitous slopes dropping thousands of meters to the valleys below.

Conversations with Makalu-Barun National Park officials, lodge owners, yarsa middlemen, and harvesters showed that there are about 3,000 people who come to collect the fungus here every spring. Unlike in other regions in Nepal, they do not leave behind much trash, carry in their own fuel wood, and cannot remember any violence.

Sherpa families from Tashigaon have been camping and harvesting yarsa here for years. Young men from Seduwa sleep in teahouses in the Valley and hike up 1,500 m to the meadows each morning to pick yarsa. There are laughing school children on holiday, and everyone seems to have a good time.

Nepali Times

Young yarsa gumba harvesters combing the slopes high above the Barun River.

The main reason for the peaceful, non-competitive atmosphere is that the quality and value of yarsa in the Makalu-Barun region is not as high as that from Tibet or Dolpo. In 2016, a kilogram of Makalu yarsa fetched only $4,800 from the local middleman, as compared to $21,120 for the famously large, yellowish, and pungent smelling Dolpo yarsa.

Nepali Times

Freshly dug yarsa gumba in a cross section of soil.

Furthermore, instead of representing up to 90 percent of a family's income as it does in Dolpo, yarsa harvests here yield the same income as portering, raising livestock, lodge management, or work at Makalu Base Camp that pay $20 per day. With the collapse of trekking this season, however, there could be more pressure.

In the Barun Valley, yarsa has been just one more source of income in an already diversified economy. Income from yarsa has just not been worth fighting over.

More importantly, villagers, the Buffer Zone Council, and the local government have developed a system to manage yarsa harvests that is fair and equitable.

As a result the stunningly beautiful but fragile Barun Valley ecosystem remains largely undisturbed and intact.

Yarsa Gumba Merchandise

Products containing yarsa gumba extracts have become increasingly popular due to the fungus' purported health benefits. Yarsa is known to some by the nickname "Himalayan Viagra," and most commercial products that make use of it emphasize anti-aging and libido-inducing qualities. In China yarsa is even added to whiskey and cigarettes.

Nepali Times

Yarsa gumba merchandise being offered for sale to middlemen.

Yu Chun Mei Cordyceps is a China-made skin cream that claims to fight skin aging and eliminate wrinkles, black spots, and pimples. The day-and-night cream claims to be made from 100 percent natural ingredients and is sold in various countries in Asia.

Probably the most widely found product to use yarsa gumba extract is tea made from the fungus, of which the varieties are many. Manufacturers of the teas claim that they treat fatigue, sickness, kidney disease, and low sex drive.

Some bars in Kathmandu serve aged aila infused with yarsa gumba, which gives the spirit a tangy aroma that competes with the smell of the alcohol. A manufacturer in Nepal even markets yarsa gumba capsules as a "health supplement."

Yarsa-Nomics

Yarsa gumba has been used by the Chinese for hundreds of years to treat a variety of illnesses, and its more recent reputation as an aphrodisiac has added greatly to its marketability. Wealthy Chinese also use it in soups and tea as a status symbol when serving favored guests.

Yarsa gumba, translated from the Tibetan as "'summer grass winter worm," carries the scientific name *Ophiocordyceps sinensis*. It is one of the most valuable medicinal fungi in the world and grows in Himalayan valleys above 4,000 m from western India to Nepal, Tibet, and Bhutan.

There are more than 200 species of *Cordyceps* (short for *Ophiocordyceps*) fungi worldwide, and in Nepal they parasitize the bodies of ghost-moth larva that live on the roots of alpine wildflowers found high up in summer yak pastures.

Once contact with the larva is made, the fungus remains dormant for about four years, after which it begins to slowly consume the larva's insides, leaving behind a shell that looks like a mummified caterpillar. The little mummy larva then slowly shifts its body to point upward toward the surface, after which a black "stroma" grows from its forehead and emerges as a fruiting body 4 cm long.

It takes sharp eyes to find these pointed, black, stem-like mushrooms, and young children, with their keen eyesight and low proximity to the ground, are by far the most successful collectors. The stroma is ever-so-carefully pulled upward using forefinger and thumb to reveal the entire yarsa gumba body, which is then cleaned, dried, and stored in cloth bags.

According to anthropologist Geoff Childs, the introduction of yarsa gumba harvesting since legalized by the Nepal Government in 2001 has "…contributed to [more] economic and environmental transformations across the Tibetan Plateau and Himalayan region…than any development scheme could envision."

SPRING MUSHROOM MIX-AND-MATCH — Kim Janik

MushRumors, Oregon Myco. Soc., May/June 2006

As a tribute to the spring mushroom season, here is a list of some common spring mushrooms listed by both their common and scientific names. Just write the letter in the space to match the common name with the corresponding scientific name. And remember, sometimes there are other names not listed here that are also commonly used. Good luck!

A	Witch's Butter	___	*Boletus rex-veris*
B	Oregon White Truffle	___	*Sarcosphaera crassa*
C	Morel	___	*Gyromitra esculenta*
D	Oyster Mushroom	___	*Calvatia booniana*
E	Shaggy Mane	___	*Amanita phalloides*
F	Sculptured Puffball	___	*Verpa bohemica*
G	Spring King	___	*Calvatia sculpta*
H	Violet Star Cup	___	*Coprinus comatus*
I	Western Giant Puffball	___	*Morchella esculenta*,
J	Death Cap	___	*Pleurotus ostreatus*
K	False Morel	___	*Tuber gibbosum*
L	Early Morel or Wrinkled Thimble Cap	___	*Tremella mesenterica*

SPORE PRINTING — Dick Sieger

To obtain a spore print from a fresh gilled mushroom, cut off the stalk if there is one. Put the mushroom cap, gills down, on white paper. (Pale yellow and pale pink spore prints can be mistaken for white if made on black paper.) If the mushroom is dry, put a few drops of water on the top of the cap. Cover with a drinking glass to retain moisture. Wait at least an hour, perhaps overnight. Hold the paper to a bright light and look for a pattern of the gills. Don't mistake a pigment stain for a spore print. Failure to obtain a spore print isn't uncommon.

In the field, I sometimes put a mushroom cap on a piece of paper, wrap it in waxed paper, put it in my collecting basket gills down, and hope to have a spore print when I get home. Sometimes in the field one mushroom will overlap another and leave a spore print on the lower mushroom. Updrafts may leave a spore deposit on the top of shelving polypores.

Quiz Answers: A-*Tremella mesenterica*; B-*Tuber gibbosum*; C-*Morchella esculenta*; D-*Pleurotus ostreatus*; E-*Coprinus comatus*; F-*Calvatia sculpta*; G-*Boletus rex-veris*; H-*Sarcosphaera crassa*; I-*Calvatia booniana*; J-*Amanita phalloides*; K-*Gyromitra esculenta*; L-*Verpa bohemica*

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