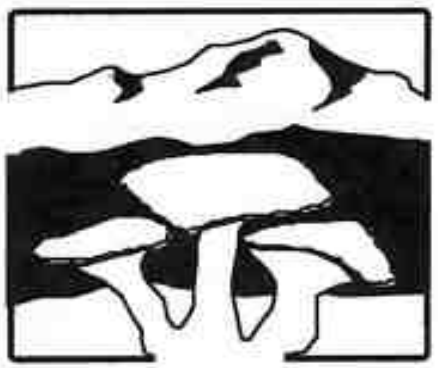
Spore-Addict Times



The Newsletter of the Pikes Peak Mycological Society 1974 – 2009 Vol. XXXV ISSUE 1 April 2009

MONTHLY MEETING:

WHEN? Monday, April 27, 2009 – The fourth Monday of the month.

WHAT TIME? 6:30 pm; the meeting will come to order at 7:00 pm.

WHERE? Pikes Peak National Bank,
2401 W. Colorado Ave. (across from Bancroft Park). Enter at the door on Colorado Ave., just west of the bank door. There you will find stairs and an elevator. You may use either. The room is on the second floor near the head of the stairs.

PROGRAM:

Frieda Davis will show off our new digital projector with a slideshow of mushroom photos taken by members over the years. Eleven members contributed to the show, so come and refresh your memory of what a mushroom looks like. Some of the photos were taken in far away places – deepest Africa, Australia, Costa Rica and Alaska. After seeing so few last year, it should be a nice change of pace.

We will also elect new officers at this meeting.

After the program refreshments will be provided by Elsie Pope and Willi Walker.

President's Notes: by Elsie Pope

Another year begins for PPMS, and may it be a better year for foraging. My old cottonwood stump is proudly producing its spring crop of Pleurotus pulmonarius, but the poor things are so confused by the on-and-off weather, they aren't growing.

The nominating committee has found a great slate of officers for you to vote upon at our first meeting, se we're off to a promising start. See you all at the bank on April 27th.

FORAY REPORT:

There were no forays undertaken over the winter months.

FORAY SCHEDULE

To go on any of the forays simply call the leader to find out where and what time to meet. You must have your dues paid for the current year and you must have a signed liability waiver on file to go on forays. **If you want to lead a foray call Esther Price at 632-5880. Esther is also the contact for ad hoc forays. Check with her to see if anyone has decided to go on an ad hoc foray that does not appear on the schedule**. Some forays will probably be to unscouted areas. Foray leaders do not guarantee success.

April 25th, Leader TBA (Call Esther for details), Probably to Beaver Creek to look for Yellow Morels.

There will be a joint foray with the Denver club this summer. The date is not yet determined.

More Chinese Imports: by Elsie Pope

Has anyone heard of the Agaricus blazer? Do you know where it is found? A friend gave me a huge plastic jar of freeze-dried mushrooms from China. It was filled with a few morels, and big fat slices of what the label called oysters, porcini, ivory portabellas, shitake and brazilian. Ester Price found a reference to the Brazilian in the newsletter “Mycelium” (Oct-Dec 2008) when the writer called it “the much-talked-about Brazilian” and identified it as A. blazer. Does anyone have more information?

A New Look For The Newsletter?

The newsletter has been around in this form for quite a while. With the advent of email and digital photography we have gradually drifted toward a more colorful layout. Is it time to change the logo on the banner to keep up with the times? Color perhaps? Maybe a different logo altogether? Let your friendly newsletter editor know what you think about this. Examples welcome!

Photo Gallery:

These pics are from a real place, somewhere near the end of a rainbow, where mystical forces cause these specimens to flourish. Can they be called specimens if they are eaten? - Patrick Harrington.

There is a morel somewhere in the previous picture. This will hone your morel hunting ability. No fair zooming in...

Newsworthy:

This is an excerpt of an interview with Paul Stametz by Derrick Jensen, published in the “The Sun” in February, 2008.

Jensen: How many different types of mushrooms are there?

Stamets: There are an estimated one to two million species of fungi, of which about 150,000 form mushrooms. A mushroom is the fruit body — the reproductive structure — of the mycelium, which is the network of thin, cobweblike cells that infuses all soil. The spores in the mushroom are somewhat analogous to seeds. Because mushrooms are fleshy, succulent, fragrant, and rich in nutrients, they attract animals — including humans — who eat them and thereby participate in spreading the spores through their feces.

Our knowledge of fungi is far exceeded by our ignorance. To date, we’ve identified approximately 14,000 of the 150,000 species of mushroom- forming fungi estimated to exist, which means that more than ninety percent have not yet been identified. Fungi are essential for ecological health, and losing any of these species would be like losing rivets in an airplane. Flying squirrels and voles, for example, are dependent upon truffles, and in old-growth forests, the main predator of flying squirrels and voles is the spotted owl. This means that killing off truffles would kill off flying squirrels and voles, which would kill off spotted owls.

That’s just one food chain that we can identify; there are many thousands more we cannot. Biological systems are so complex that they far exceed our cognitive abilities and our linear logic. We are essentially children when it comes to our understanding of the natural world.

Jensen: In your book you say that animals are more closely related to fungi than they are to plants or protozoa or bacteria.

Stamets: Yes. For example, we inhale oxygen and exhale carbon dioxide; so do fungi. One of the big differences between animals and fungi is that animals have their stomachs on the inside. About 600 million years ago, the branch of fungi leading to animals evolved to capture nutrients by surrounding their food with cellular

sacs — essentially primitive stomachs. As these organisms evolved, they developed outer layers of cells — skins, basically — to prevent moisture loss and as a barrier against infection. Their stomachs were confined within the skin. These were the earliest animals. Mycelia took a different evolutionary path, going underground and forming a network of interwoven chains of cells, a vast food web upon which life flourished. These fungi paved the way for plants and animals. They munched rocks, producing enzymes and acids that could pull out calcium, magnesium, iron, and other minerals. In the process they converted rocks into usable foods for other species. And they still do this, of course. Fungi are fundamental to life on earth. They are ancient, they are widespread, and they have formed partnerships with many other species. We know from the fossil record that evolution on this planet has largely been steered by two cataclysmic asteroid impacts. The first was 250 million years ago. The earth became shrouded in dust. Sunlight was cut off, and in the darkness, massive plant communities died. More than 90 percent of species disappeared. And fungi inherited the earth. Organisms that paired with fungi through natural selection were rewarded. Then the skies cleared, and light came back, and evolution continued on its course until 65 million years ago, bam! It happened again. We were hit by another asteroid, and there were more massive extinctions. That's when the dinosaurs died out. Again, organisms that paired with fungi were rewarded. So these asteroid impacts steered life toward symbiosis with fungi: not just plants and animals, but bacteria and viruses, as well.

Jensen: Can you give some examples of these partnerships?

Stamets: A familiar one is lichens, which are actually a fungus and an alga growing symbiotically together. Another is "sleepy grass": Mesoamerican ranchers realized that when their horses ate a certain type of grass, the horses basically got stoned. When scientists studied sleepy grass, they found that it wasn't the grass at all that was causing the horses to get stoned, but an endophytic fungus, meaning one that grows within a plant, in the stems and leaves.

Here's another example: At Yellowstone's hot springs and Lassen Volcanic Park, people noticed that some grasses could survive contact with scalding hot water — up to160 degrees. Scientists cultured these grasses in a laboratory and saw a fungus growing on them. They thought it was a contaminant, so they separated the fungus from the grass cells and tried to regrow the grass. But without the fungus the grass died at around 110 degrees. So they reintroduced this fungus and regrew the grass, and once again it survived to 160 degrees. That particular fungus, of the genus *Curvularia*, conveyed heat tolerance to the grass. Scientists are now looking at the possibility of getting this *Curvularia* to convey heat tolerance to corn, rice, and wheat, so that these grasses could be grown under drought conditions or in extremely arid environments, expanding the grain-growing regions of the world.

Other researchers took a *Curvularia* fungus from cold storage at a culture bank and joined it with tomatoes, expecting that it would confer heat tolerance. But the tomatoes all died at 105 degrees. They discovered that the cold storage had killed a virus that wild *Curvularia* fungus carries within it — which was odd, since you'd think cold storage would keep the virus alive. When they reintroduced the virus back into the *Curvularia* cultures and then reassociated the fungus with tomato plants, the plants survived the heat. So this is a symbiosis of three organisms: a plant, a fungus, and a virus. Only together could they survive extreme conditions.

These examples are just the tip of the iceberg. They show the intelligence of nature, how these different entities form partnerships to the benefit of all.

Jensen: Of course this raises the question of boundaries: Is that tomato-fungus-virus one entity or three? Where does one organism stop and the other begin?

Stamets: Well, humans aren't just one organism. We are composites. Scientists label species as separate so we can communicate easily about the variety we see in nature. We need to be able to look at a tree and say it's a Douglas fir and look at a mammal and say it's a harbor seal. But, indeed, I speak to you as a unified composite of microbes. I guess you could say I am the "elected voice" of a microbial community. This is the way of life on our planet. It is all based on complex symbiotic relationships.

A mycelial "mat," which scientists think of as one entity, can be thousands of acres in size. The largest organism in the world is a mycelial mat in eastern Oregon that covers 2,200 acres and is

more than two thousand years old. Its survival strategy is somewhat mysterious. We have five or six layers of skin to protect us from infection; the mycelium has one cell wall. How is it that this vast mycelial network, which is surrounded by hundreds of millions of microbes all trying to eat it, is protected by one cell wall? I believe it's because the mycelium is in constant biochemical communication with its ecosystem.

I think these mycelial mats are neurological networks. They're sentient, they're aware, and they're highly evolved. They have external stomachs, which produce enzymes and acids to digest nutrients outside the mycelium, and then bring in those compounds that it needs for nutrition. As you walk through a forest, you break twigs underneath your feet, and the mycelium surges upward to capture those newly available nutrients as quickly as possible. I say they have "lungs," because they are inhaling oxygen and exhaling carbon dioxide, just like we are. I say they are sentient, because they produce pharmacological compounds — which can activate receptor sites in our neurons — and also serotonin-like compounds, including psilocybin, the hallucinogen found in some mushrooms. This speaks to the fact that there is an evolutionary common denominator between fungi and humans. We evolved from fungi. We took an overground route. The fungi took the route of producing these underground networks that are highly resilient and extremely adaptive: if you disturb a mycelial network, it just regrows. It might even benefit from the disturbance.

I have long proposed that mycelia are the earth's "natural Internet." I've gotten some flak for this, but recently scientists in Great Britain have published papers about the "architecture" of a mycelium — how it's organized. They focused on the nodes of crossing, which are the branchings that allow the mycelium, when there is a breakage or an infection, to choose an alternate route and regrow. There's no one specific point on the network that can shut the whole operation down. These nodes of crossing, those scientists found, conform to the same mathematical optimization curves that computer scientists have developed to optimize the Internet. Or, rather, I should say that the Internet conforms to the same optimization curves as the mycelium, since the mycelium came first.

A Mushroom A Day...

Yale Medical School Study Shows Benefits of Japan's AHCC

Certain foods are known for their immune boosting properties. The more of them you can work into your day, the better equipped you will become at fighting off viruses and keeping diseases at bay.

"One of the Japanese secrets of longevity and good health is their high consumption of medicinal mushrooms," says Dr. Pescatore, whose book, 'Mycology and Biotechnology: Development of AHCC and the Future of Mushroom Science' (Basic Health Publications) is due out next year. "Studies show Japanese medicinal mushrooms can increase the production and activity of white blood cells, which help fight off viruses, infections and abnormal cells that constantly attack our bodies."

If you can't consume a handful of mushrooms each day, don't fret. Dr. Pescatore recommends a special extract of hybridized Japanese medicinal mushrooms called AHCC. The dietary supplement has been used in Japan for over 20 years and has undergone research at Yale and Harvard in addition to being part of more than 30 published studies (www.ahccresearch.org). It is widely recommended by over a thousand doctors worldwide for daily immune support and prevention.

"The activation of the body's own immune system can be very effective in both the treatment and prevention of diseases resulting from stress and age," says Dr. Pescatore.

Don't Get Lost

Several outfitters and online stores are selling a new kind of GPS unit lately. It is a BackTrack, by Bushnell. You just push one button to mark your start point. It will then take you back to where you started. Simple. Cost – around $60. Get one!

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The Pikes Peak Mycological Society, a nonprofit organization dedicated to the advancement of mycology, publishes Spore-Addict Times monthly from April-October. Membership is open to anyone wanting to study mycology. Annual dues are $15 for individual and family memberships. **Submission of ideas, articles, reviews, letters, artwork and recipes are welcome.**

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MYSTERY MUSHROOM

by Frieda Davis

I can be found in spring and summer on dead hardwood. My cap is 1 - 3 cm across, convex becoming depressed, vase-shaped or umbilicate, golden-brown to dark brown My margins are ciliate. My pores are large (1-2 mm), angular or hexagonal, white or yellowish and decurrent. My stipe is 2 - 4 cm long and 3 - 5 mm thick, yellowish brown, lightly scaly with white tomentum at the base.

Who am I?

Spore-Addict Times
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