



Symbiosis[©]

The newsletter of the Prairie States Mushroom Club

Volume 35:2

Summer

<http://iowamushroom.org>

From the President, Dean Abel

In this issue Bobbie brings us up to date on her struggle with Lyme disease.

The ongoing debate about the reality of the long lasting symptoms attributed to Lyme disease and other chronic conditions (such as fibromyalgia, chronic-fatigue syndrome, and depression) versus the possibility of psychosomatic disease is discussed in a review by Lidija Haas in *New Yorker* magazine (Books, June 4th & 11th). The book under discussion is a memoir by Porochista Khakpour, "Sick" (Harper), in which she describes her years-long effort to find a diagnosis and treatment for her Lyme disease.

Too often sufferers are dismissed as unreliable reporters of their symptoms. The standard test for Lyme disease is imprecise, prone to false positives and negatives. Many doctors are baffled and don't like to admit it. Haas asks, "Is Lyme disease a feminist issue?"

Dr. Eugene Shapiro cites studies that say "Patients given diagnoses of chronic Lyme disease were more than twice as likely to be women..." suggesting that other chronic conditions may be misdiagnosed as Lyme disease "and that, as a result, many women may not be receiving appropriate treatment." Dr. Sami Saha writes, "Women – especially women of color – are often disbelieved and dismissed by medical professionals. This is indeed an immense problem."

We wish the best for Bobbie. Get well soon and quickly. 

From the Editor, Dave Layton

This Issue's theme: *All Things Oyster*



If one mushroom can steer the world on the path to greater sustainability, fighting hunger, increasing nutrient return pathways in ecosystems, destroying toxic wastes, forestalling disease, and helping communities integrate a complexity of waste streams, oysters stand out... Oyster mushrooms are well positioned to lead the way for rebalancing vast waste streams that currently overload our ecosystems.

– Paul Stamets. *Mycelium Running: How Mushrooms Can Help Save the World*. 10-Speed Press, Berkeley, CA, 2005. Page 280.

Thanks Mike Krebil for providing the above Stamets quote along with some great articles for this newsletter.

(cont. on pg. 11)

PSMC Awarded NAMA Mycoflora Grant



Congratulations Sarah DeLong-Duhon on writing a successful grant for the MycoFlora fungi gene sequencing project! Thanks also to the PSMC Board for approving the project and to Dr. Rosanne Healy for providing professional assistance to our project.

We've already begun collecting samples and documenting finds on iNaturalist. This project makes citizen science fun, easy and valuable! This grant from the Mycoflora project has provided us with 30 extra sampling tubes for which the sequencing costs will be waived. Dean now has most of those tubes and can work with anyone interested in contributing specimens for sequencing. Dean Abel lives in Iowa City near many of our club members. Email iowamushroom@gmail.com if you want sample tubes and we'll make sure he gets in touch with you.

Sarah was also awarded the PHIL Student Success Grant from the University of Iowa that will cover sequencing costs for 50 of the 100 remaining sample tubes. Finally, the club has agreed to pay for 30 of those samples so we can reach a total goal of 110. With that large number and several people sampling, Sarah has created a Google Docs spreadsheet to keep track of all the fungi that have been sampled. A link for viewing the sheet will be available on the club's website (iowamushroom.com), and anyone who would like permission to edit the spreadsheet can email Sarah at sarah-delong-duhon@uiowa.edu or sarahgduhon@gmail.com for access.

I have my sampling tools in a sour-cream container along with a tissue soaked in rubbing alcohol to clean any stray DNA off of the collection tools. I use the razor blade to cut out an interior part of the mushroom to ensure that the DNA of the sample is the only DNA in the tube. The tubes come with lysing solution that preserves the samples for a long time. I realized that I also need to get a little fishing tackle box with airtight compartments so I can collect several species on one outing.

(cont. on pg. 10)

Oyster Mushrooms – Mycoremediation, Cosmetics, and Building Materials

by Mike Krebill



Photo from the Motherboard article Phil Ross Grows Furniture with Mushrooms
https://motherboard.vice.com/en_us/article/bmmje8/houses-of-the-future-grown-out-of-mushrooms

Mycoremediation is a compound word: *Myco* (fungus) and *remediation* (to neutralize, clean, break down, render harmless). Basically, it is the process where mushrooms break down harmful substances. The harmful substances could be toxic wastes, pesticides, sludge from oil spills, wastewater, farm runoff, and industrial pollution. Mushrooms serve as decomposers in our world, whether in nature by returning leaves and logs to soil or in the man-altered landscape through mycoremediation.

Had to smile as I remembered one author's article on mycoremediation – I should have written the exact title down, but it was something like this: "Growing Edible Oyster Mushrooms on Used Diapers." Got to thinking I could do an internet search, so I did, and I found it: "Tasty Mushrooms from Dirty Diapers." Since some of you are likely reading this on a pdf emailed to you, here is the link to a nicely written article: <https://mycotek.org/index.php?threads/530/>

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Lyme: A Life Changing Disease, part 2

Continued from *Symbiosis*, Spring 2018 35:1

By Bobbie Ney, Iowa City, IA

After being treated for Lyme disease with a three week course of the antibiotic doxycycline from the end of December to the middle of January, I still had the same symptoms. Since learning that I had Lyme disease, I researched all the treatment options to decide what type of treatment I wanted to pursue if my symptoms persisted. Initially, the hardest part of my disease was making the decision about my treatment and then finding a doctor that would treat me. This was a nightmare especially when I had symptoms that were affecting my brain and making it hard for me to concentrate.

Some of the possible treatments included the following: (1) One solution prescribes a prolonged antibiotic treatment for as long as the symptoms occur. The people that I know who have used this method never got completely rid of the bacteria and were on medication off and on for years. (2) Stem cell transplants are being used to treat Lyme disease in Germany. (3) Some clinics use herbal infusions without any antibiotic treatment. (4) The treatment that I chose is a very aggressive way of treating Lyme disease and various clinics in the US use this treatment. It involves the use of several medications to try to kill all the bacteria in my body both good and bad. Not only is it very hard on your body but it is very expensive. Most Lyme literate doctors are in clinics that do not take insurance. Medication is covered; however, many of the medications are tier 3 and can be costly.

Once I decided on the treatment, I had to find a doctor who was Lyme literate and used this method. I contacted a couple Lyme associations and got the names of possible doctors in my area. I also spoke to two people who had used the aggressive method of treatment. One was treated in Minnesota and the other was treated in California. My preference was to find someone closer to where I lived.

The doctor that I chose was mentored by Dr. Richard Horowitz who wrote the book, "Why Can't I Get Better". He is from New York State and treats people with Lyme disease. He is known internationally. People are very secretive about giving names of Lyme literate doctors because the medical profession has taken some licenses away from these doctors for prolonged treatment with antibiotics. However, Iowa passed a law in March 2017 which "allows a physician to expand upon the traditional

standards of care for Lyme patients if the physician has thoroughly reviewed all clinical information about tick-borne diseases and has the patient's consent." Some other states have also passed this law. Illinois is attempting to pass this law this year.

I started aggressive treatment for Lyme disease at the end of February. Before starting my treatment, my doctor did another Lyme blood test to see if the three weeks of antibiotic had any effect. My blood test was the same; I was reactive in 8 of the 10 tests using the Western Blot [an analytic technique that identifies specific bacterial proteins]. The hardest part of this process has been the treatment. I am taking doxycycline, hydroxychloroquine (used for malaria treatment) and azithromycin. I just started penicillin shots 3 times per week. The first 2 months of treatment were extremely hard. I had nausea, loss of appetite and fatigue and spent most of my time in bed. I lost 10 pounds. Some of the problems were related to the azithromycin which is extremely hard on me. The doctor has me now taking this 3 times per week instead of daily.

The other reason for my adverse side effects is from the Jarisch-Herxheimer Reaction (herxing). This happens when the Lyme spirochete is broken down creating inflammation. If the toxins don't leave your body quickly, they can poison your system and give you flu type symptoms. Information that I have read said that you feel like you are going to die and people sometimes end up in the ER. This is what happened to me after 1 month of treatment.

I went off the medication for 5 days and then started back again. The 2nd month was still very bad. After the 2nd month I stopped my medication for 3 days. I am now almost at the end of the 3rd month. The azithromycin still bothers me but I am able to do things socially again. There are days that I feel very bad especially on the days I take azithromycin. There are times I wonder if I can last six months to a year of this treatment which is the time period that my doctor gave me. My doctor is good about adjusting my meds if they become too difficult to tolerate. I am also taking some herbal medication such as probiotics, glutathione and another herbal to prevent a yeast infection. I am very hopeful that this treatment will be effective, but only time will tell. 

Eat Me

By Karen Yakovich

This winter granted us with a few hiking days. On one I was lucky enough to find an oyster. Yes it was over due, but I was confident that I could take it home and cultivate it. I have found oysters to be very friendly. I layered it in boiled cardboard and let it go to town. It was hungry. It cleaned its plate. It was ready for layering in pasteurized straw. After being in the straw for a week I noticed no change. I thought maybe cooler temps would be better. I had kept it at 70. A week in cooler temps did nothing either. I've had success with this method from commercial oyster spawn. Wild oysters didn't seem to care for straw. They will still share a tree with other species though, because they're friendly. Eventually, these oysters did fruit! So here is a silly lightly instructional article from the perspective of the mushroom:

Hey there! I'm an oyster mushroom. I'm a pretty friendly fungi. You can take me home and keep me as a pet.

My favorite food is cardboard that has been boiled for 20 minutes. Cut the live parts of me up. Layer me between the cooled, drained pieces of cardboard in a closed but not airtight container. Lettuce boxes work great. You'll see me feed in a few days.

When I eat all the cardboard I can be layered with pasteurized straw.

After I've eaten all the straw, I will fruit in flushes.

You can harvest and eat me! Or if you're too busy you can neglect me and I'll still fruit! And you can walk by me every day and behold my beauty, until I'm all done. 



Wild cap in winter



Sliced cap inoculating cardboard



Growing in spinach container

Fun Fact

In 1988, an oyster mushroom was found in Sicily that was almost eight feet in circumference. It was 20 inches thick and weighed 42 pounds. (p. 341 of *The Fungal Pharmacy*, by Robert Rogers, North Atlantic Books, Berkeley, CA, 2011.)



Oysters fruiting on straw



Golden Oysters: Invasive or just Naturalized?

By Sarah Delong-Duhon

The following is text from a research presentation by Sarah – Dave Layton

What are they?

- Golden Oyster Mushrooms, *Pleurotus citrinopileatus*, are a wood-decay fungi native to Japan, northern China and east Russia – generally around the 40°N latitude.
- This species is used widely for home cultivation, and captive populations have “escaped” into the wild as their spores are carried in the air.
- There are several *Pleurotus* species native to the US: *P. ostreatus*, *P. pulmonarius*, and *P. populinus*.

When did they get here:

The Prairie States Mushroom Club has been finding Golden Oyster Mushrooms since 2010 (Layton and Abel, 2010)

Why are they so popular for Cultivation:

- Numerous studies have been published about potential health benefits of Golden Oyster mushrooms.
- One such study showed that a glycoprotein extracted from *Pleurotus citrinopileatus*, PCP-3A, demonstrated significant inhibitory effects on the growth of leukemia cancer cells (Chen et al., 2009)
- A lectin derived from *Pleurotus citrinopileatus* has been shown to cause an 80% reduction in sarcoma tumor growth when administered intraperitoneally in mice. (Li et al., 2008).

How will they affect populations of native *Pleurotus* species?

- If Golden Oysters are too competitive, they could displace native species.
- They may use the same trees as substrate (hardwoods like oak and elm).
- Golden Oysters were bred for cultivation, which means they were optimized for resiliency and larger fruits, thus they can produce more spores.
- Golden Oysters can be successfully hybridized with other species such as *Pleurotus pulmonarius*, so Golden Oysters could potentially change population genetics of native oysters if compatible mating types come in contact (Rosnina et al., 2016).

How else could Golden Oysters prove to be invasive?

Dave Layton, editor of the Prairie States Mushroom Club’s *Symbiosis* newsletter, thinks that *Pleurotus citrinopileatus* is able to quickly take advantage of elm trees that die of disease or damage because sometimes it fruits all over the entire tree within a year of dying.”

Current Research:

Andi Bruce, a graduate student at the University of Wisconsin La-Crosse, is doing population genetics on wild *Pleurotus citrinopileatus* in an attempt to trace their naturalization from Asia.

(cont. on pg. 11)

Fried Potatoes with Dryads and Yellow Oysters

Here's a flexible recipe that goes great with the other mushrooms you're sure to find when you're out hunting for morels. Don't forget dryads and yellow oysters both fruit throughout the summer and fall too. So this could be a tasty treat almost any time – Dave Layton

Use a large skillet.

3 C. potatoes, 1.5 C. very young dryads (pores still tiny), and $\frac{3}{4}$ to 1 C. young fresh yellow oysters (pick only caps that are still small if you have a choice).
Tablespoon chives – or green onions (experiment with what you have for onion-like stuff).

For dryads:

1½ teaspoon Heinz chili sauce or possibly experiment with Worcestershire sauce, ketchup and Tabasco – to taste.

1 Tablespoon Madeira wine

Some folks like dryads' strong flavor as is. If you were one of those I'd go for a lighter sauce to dryad ratio.

For Yellow oysters:

1 tablespoon dry white wine

½ tablespoon soy sauce

Scrub and slice potatoes into your favorite frying shape; begin frying in extra-light olive or vegetable oil for 4 minutes. Flip potatoes and add onions; fry til onions are fragrant. Move potatoes toward the outside of the pan; add a little oil to the center of the pan if needed and add chopped dryads. When dryads start to cook, add Madeira cook a minute or so and add chili sauce or mixture sauce. Simmer another couple minutes. Then stir in with potatoes and move mixture toward the sides of the pan.

Add a little more oil in the middle if needed and add oysters to the middle. Add white wine and soy sauce as soon as Yellow oysters start to cook. Cook 2 – 3 minutes till wine and soy sauce boil down a little then stir in with the other ingredients.

Cook on low another couple minutes and salt and pepper to taste.

Serve. Try small servings at first to make sure your digestive system can handle it. 🍴



Potatoes, yellow oysters and dryads



Potatoes, yellow oysters and dryads cooked

Medicinal Properties of *Pleurotus* species

by Mike Krebill

Oyster mushrooms are used medicinally as a nerve tonic and to lower high cholesterol. Many other promising applications have been discovered, ones that we may well see approved by the Food and Drug Administration within the next decade.

High levels of lovastatin occur in oyster mushrooms. Lovastatin is a well-known pharmacological agent that was approved in 1987 for treating high cholesterol, which can reduce the likelihood of getting heart attacks. It has an advantage over other statin drugs, such as Lipitor, Mevacor, and Zocor, in that it can be used in cases where pregnancy, liver disease, or alcoholism is involved.

In 2000, a protein was isolated that showed promise in inhibiting HIV. A clinical trial at San Francisco General Hospital investigated its safety and potential efficacy. Further studies may prove the usefulness of oyster mushroom extracts as an adjunct to HIV therapy.

Laboratory studies of the mushroom's enzymes show that they can inhibit the hepatitis C virus.

Aspergillus niger is an aggressive mold that threatens people with an immune deficiency. The mycelium of oyster mushroom is effective against the mold.

The mushrooms have been tested as antibiotics against bacteria as well. Antimicrobial activity has been demonstrated when applied to cultures of *Bacillus spp.*, *Escherichia coli*, *Plasmodium spp.*, and *Pseudomonas spp.*, to name a few. Low-intensity laser light, when used in combination with oyster mushroom extracts, increased the antibiotic activity up to 20%.

A 1999 study found that the dried mushroom powder has antacid properties.

A series of studies has shown that oyster mushroom extracts possess antitumor activity, and may help fight colon, bladder, and prostate cancer. In addition, they inhibit the proliferation of leukemia cells.

(cont. on pg. 11)

What's in a Name?

by Dave Layton

When Doug Mueller of Midwest Wild Edibles and Foragers Society contacted PSMC for help identifying the pictured mushroom, I



quickly replied *Pleurotus dryinus*. I'd figured that one out decades ago - I thought. At the same time Dean provided him with a more detailed explanation of why it's *P. levis*, not *dryinus*. Hmm. I'm wrong again? Doug probably thinks I'm some kind of sputz! But wait, Michael Kuo says the 2 are virtually indistinguishable - even microscopically. However, apparently they can't mate which means they're different species. Okay, rather than come to blows with Dean over this one, I'm calling them *P. levis* from now on.

One thing I always knew for sure was that common oyster mushrooms come in all shapes and sizes and grow at all different times of year on many kinds of wood. Yet I've always known they're all the same species (*P. ostreatus*) because they all taste the same - right?

So when Sarah identified what looked like a common oyster as *P. pulmonarius* I knew I was going to have to set that young lady straight. So I looked up *P. pulmonarius* to see what they really are and, low and behold, there are all kinds of possible differences according Michael Kuo. Even worse, I may have been misidentifying another species, *P. populinus*, as *P. ostreatus*. This is terrible! How can I ever tell my wife that I'm not even certain of what species of mushrooms I've been feeding her? Fortunately, all three taste like oyster mushrooms, which are her favorites. So I just won't mention species names to her and she'll be as happy as a clam - right? 

Looking Deeper

a book review by Mike Krebill

Not long ago, The Crown Publishing Group sent our Prairie States Mushroom Club a promotional copy of a new book on foraging and eating mushrooms. I eagerly volunteered to look at it and write a review for the summer issue of *Symbiosis*, our quarterly newsletter.

Tales from a Forager's Kitchen, by Johnna Holmgren. Rodale, 2018, is a visual treat with 126 entrancing photos in its 255 pages. Like her blog, *FoxMeetsBear*, this book gives you an endearing look at her life and her family. Recipes are organized into logical chapters: breakfast, lunch, dinner, beverages, desserts and delights, and condiments. Johnna tells about her family's life in the woods. A skilled writer, she shares her thoughts and philosophy in an eminently readable fashion.

Yesterday's deluge in Southeastern Iowa (2 3/8" on my garden's rain gauge) caused the chanterelles in my yard to pop up. It gave me a chance to try one of Johnna's recipes: Chanterelle Bacon Brussels Sprouts. Imagine



Chanterelle bacon brussels sprouts ready for the oven

wrapping Brussels sprouts with bacon, inserting a toothpick to hold the bacon in place, setting them on top of parchment paper on a lined sheet pan, brushing them with olive oil, and sprinkling them with chopped chanterelles and sage leaves and a bit of salt. Bake for 30 minutes in a preheated 400° F. oven. It sounded simple and delicious. And that was exactly what they were. I had eight for lunch. I found them addictive, hot or cold. Every time I passed by the sheet pan that was set on a rack to cool, I popped one more in my mouth and carried away a second one because they are so tasty. This recipe is easy and delightful, a real keeper. The final fourteen disappeared when I took them to our Scout troop's

Family Night Potluck and Court of Honor Monday. Some boys made faces when I mentioned Brussels sprouts, but the boys who were brave enough to try them came by afterwards and told me that they were glad that they did, that they really liked them that way. Every adult also had a compliment. In my opinion, a single recipe like this one is worth the price of the book. It makes me want to try more of the 80 recipes she shares.

As I delved deeper in the book, one of my initial concerns was whether the author really knew her mushrooms, because across from the recipe for Chanterelles Bacon Brussels Sprouts on page 120 is a photo of another mushroom with bacon and Brussels sprouts. It made me wonder why Johnna would choose to use that photo. So I decided to ask her. She had hired a photographer who was on a time schedule, and while the chanterelles had been plentiful two weeks earlier, they were gone from the woods when he arrived. As a photographic substitute for the chanterelles, Johnna elected to use Forest Nameko (a Japanese mushroom available fresh at Hy-Vee. The mushrooms resemble a cluster of small honey mushrooms.) She didn't add a note to readers to explain her substitution, perhaps because of her philosophy that readers of her blog and book ought to be responsible for their own careful identification using references, and not wedded to an illustration which could be misleading. A note from her about the substitution, however, might have kept people like me from doubting her credibility regarding mushroom identification.

My second concern on mushrooms is that Johnna advocates adding raw chopped mushrooms as a garnish to dishes. And she doesn't cook mushrooms that she coats with dark chocolate. This caused me to raise my eyebrows when I first read it, yet Johnna and her family and friends have had no problems when dining on raw mushrooms. I emailed her and learned that she was unaware, as are many, that the North American Mycological Association has kept a registry of mushroom poisonings in North America, and that raw morels and shiitakes (which she recommends using) have made the list. She assumed that any mushroom that was an edible mushroom could be eaten either raw or cooked. She was grateful for the revelation and promised to make followers of her blog postings, *Fox Meets Bear*, aware of the need

(cont. on back cover)

UW La Crosse Golden Oyster Study is Being Continued

Andrea Bruce (UW La Crosse) has decided to continue collecting specimens of Golden Oysters this year. She says,

The explosion of fruitings has made me think this research will really benefit from a follow-up study with more specimens. I don't have the funding to do the project yet, so nothing is guaranteed, but if I wind up with compelling results from the first dataset, and I already have the specimens collected for another study, I think I'm far more likely to get funded.

Ms. Bruce has created this page if you are interested in contributing. <https://andibruce.com/golden-oysters/>

Within, there is a link to post sightings only. If you wish to collect and send dry specimens and a spore print there are instruction for that also. As an alternative, you could post sightings to iNaturalist. That would make it visible to more people. An iNaturalist account is easy to create and use. You can enter data directly from a smart phone or use a computer. If you plan to help with the Iowa Mycofloral Project you will need to create an iNaturalist account. 

Upcoming Forays and Annual Meeting

Foray - Saturday, September 1st 10:00 am – noon Maquoketa Caves State Park, Jackson County

Maquoketa caves is a lovely park with deep woods and many ancient trees.

Directions: Take Highway 61 north out of Maquoketa. Turn west on State Hwy 428 Caves road. We'll meet in the main parking lot by the big cave.

Foray - Saturday, September 29th 10:00 am – noon Big Grove Preserve

Big Grove Preserve is a forty-acre woodland adjacent to the Coralville Reservoir off Sugar Bottom Road, which makes up part of the original "Big Grove" noted by the first settlers to describe Johnson County's landscape. There is a network of hiking trails in the property.

Directions: Take 245th St. NE west from Sugar Bottom Road, about 2 mi. from Newport Rd., continuing onto Starry Night Road/Starry Night Court to a turn-around located at the entrance to the Preserve. Ignore the "Private Road" sign. This is a public road. Here is a Google Maps link to the location: <https://goo.gl/maps/RdB1mg8qfTT2>



Foragers finding morels in chopped scrub at Wickiup Hill near Cedar Rapids

Foray and Annual Meeting – Saturday, October 6th Eden Valley Park Clinton/Jackson County border.

Foray 10 – 12 with brown bag lunch and meeting following. Wild mushroom snacks will be available for folks to try. Meet at the nature center. Eden Valley has a wide variety of woods including a natural stand of Eastern White pine and mixed hardwoods This is the place where we first found wild yellow oysters at a foray.

Directions: From Hwy 64 turn south on Y32 (50th Ave) at Baldwin. Or from Highway 30 turn north on the Hoover Hwy at Lowden. Continue across the Wapsi to HWY 136 turn right about 1.5 miles then north on Y32 (120th Ave). 

PSMC Awarded...

(cont from pg. 2)

Sarah: “I have been collecting my samples in Ziploc snack bags, placed in a reed basket so they don’t get squished, and taking them out immediately upon returning home. I use a cap to spore print when necessary (if I am not sure of species) and immediately take tissue from the inner stem of the mushroom with tweezers (or taking a piece of the cleanest tissue I can find if there is no stem) and placing it in the tube with the field slip number already taped to outside. It’s important to clean your tweezers and blades with alcohol between samples to denature any fungi DNA left on your instruments and avoid cross contamination. The sample(s) need to be either air dried or dried in a dehydrator at 90 degrees Fahrenheit for as long as it takes to make them cracker dry, then placed in a plastic bag with their field data slip, because they will eventually be sent to the Ada Hayden Herbarium in Ames.”

We are hoping that most of our samples are of species that are underrepresented in the Ada Hayden Herbarium and GenBank, where sequences are typically stored. Following is a link to the fungal collection at the Ada Hayden Herbarium so you can check to see if you found something they’re missing: <https://www.herbarium.iastate.edu/fungi-iowa>

What I like most about this project is how it causes me to pay much closer attention to fungi that I would have ignored in the past. It brings a whole new dimension to my love of fungi. I hope it does the same for other PSMC members too. 

Oyster Mushrooms

(cont. from pg. 2)

For those of you who are reading this on a paper copy, thanks to research in Mexico, and reported in the journal *Waste Management*, Oyster mushrooms can devour 90% of a disposable diaper in 2 months, as the diaper is largely cellulose. If the diaper is sterilized with steam to kill bacteria and fungi that might out-compete the oyster mushroom mycelium, and the steam also kills organisms that could cause disease, then the resulting oyster mushrooms could be eaten. (The university professor in Mexico City who authored the report has done so, to prove her point.) The cost of steam sterilization would likely make it an impractical way to raise food, even if people could overcome thinking about where the mushrooms came from, she said.

5 billion diapers a year are thrown away in Mexico alone where this research took place. When you consider the world-wide magnitude of the problem, and the impact on landfills, we ought to appreciate the help that mushrooms can give us through mycoremediation.

Oyster mushrooms contain high concentrations of sphingoglycolipids. These compounds can be used to moisturize and protect skin, so there’s a possibility that they may be used in the cosmetics industry.

Oyster mushroom mycelium is being used to create housing insulation. The process is to fill panels with lightweight buckwheat or rice husks, hydrogen peroxide, water, silica, and inoculants.

In 10 to 14 days the mycelium fills the entire space, and the panel is oven-dried. Ecovative Design, the company who came up with this innovation, also makes biodegradable replacements for styrofoam that are finding a growing market in packaging and shipping applications. The HON Company in Muscatine, Iowa, has used biodegradable packaging and shipping materials for their office furniture and files for many years, and it is likely that Ecovative may be their supplier. Ecovative has a delightful video you can watch at this link: <https://youtu.be/HqmCSml15jU> 

From the Editor

(cont from cover)

When I first started hunting morels 45 years ago, they were the only wild mushroom I was interested in. I didn't find any one day, but I did find this big clump of tan and white gilled fungus on a log. I thought I'd see if I could learn what it was. So I made the first of many trips to the Clinton library, which had a large selection of mushroom books at the time. I quickly found oyster fungus and even how to fry them with eggs and bread crumbs - yum. They remain a significant part of my diet to this day, though I now eat them many different ways.

Oyster mushrooms played a foundational role in my developing love of fungi. The more I learn about their capabilities as well as the capabilities of related species, such as yellow oysters, the more amazed, astounded, and maybe a little horrified I become. I hope you enjoy reading about the good, the bad, the beautiful and the ugly of All Things Oyster. 

Medicinal Properties...

(cont. from pg. 7)

A 2007 study found that the mushroom was synergistic with glyburide in treating diabetes.

While commercially available as a medicine to reduce cholesterol and as a nerve tonic, oyster mushroom drugs have not yet been approved for antibacterial, antitumor, or antiviral uses. The United States Food and Drug Administration has received more than its fair share of criticism through the years for taking a long time to test and approve of what could be potentially useful pharmaceuticals. One of the reasons for proceeding with caution in this case, however, is that 10 percent of Europeans and North Americans have an allergy to oyster mushrooms. 

Golden Oysters...

(cont. from pg. 5)

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Looking Deeper

(cont. from pg. 8)

to be careful in that regard. The prevailing advice from mushroom clubs with which I have been associated is to cook ALL mushrooms, even the store-bought white button mushrooms, the brown cremini or “baby bella”, and portabella mushrooms. While this advice seems prudent, it may not be necessary as more becomes known. If you’d rather not take the chance, simply cook the mushrooms first and then use them in the recipes that she has created and enjoys.

Thanks to recent rains, I have an abundance of chanterelles in my yard as I write this. Tomorrow morning, I’ll collect and clean them, then sauté them and follow Johnna’s Dark Chocolate Dipped Fungi recipe. She recommends freezing them. I like the idea of having some for my sister and her husband to sample when they visit later this month. The chanterelles may be gone by then.

I enjoyed spending time with Johnna Holmgren’s new book. I found her writing, philosophy, and lifestyle intriguing. The photographs are lovely; the photographer that she chose did an amazing job. Johnna was open to my emailing her questions, and she was courteous with her answers. I tried two of the recipes, making each one twice. The Chanterelle Bacon Brussels Sprouts are my favorite so far, and that recipe alone – as I said earlier – is worth the price of the book. I’m looking forward to investigating the other recipes and plan to order my copy of the book today, as I’ve promised to send the mushroom club’s copy to the newsletter editor. Because of my beliefs, the only change I will make when following Johnna’s recipes is that I will cook all the mushrooms I use. Would I recommend this book to others? Yes, with the same caution. This is a nicely crafted book by a talented writer. 