

# The Potomac Sporophore

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Don't miss the  
Tasting Meeting!  
August 27, 2-4 PM  
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## Lone Star Tick Bites Can Cause Allergy to Red Meat

Thomas Roehl  
Newsletter Editor

Over the past couple of decades, an unusual allergy has been steadily becoming more prevalent across southern and eastern North America. After being bitten by the lone star tick (*Amblyomma americanum*), some people suddenly develop a severe allergy to red meat.

For people who develop this allergy, the initial experience can be very disorienting. After eating red meat for dinner, sufferers often wake up in the middle of the night with symptoms of anaphylaxis. These can include: itchy hives, difficulty breathing, decreased blood pressure, and swelling of the face, lips, tongue, and throat. This reaction is frequently life-threatening and many sufferers end up in the emergency room. Some lucky people do not develop severe

reactions and just have to deal with recurring gastrointestinal distress (vomiting, diarrhea, etc.).

Unlike most allergies, tick-related red meat allergy starts producing symptoms three to six hours after encountering the allergen (red meat). This can make identifying the allergen difficult, since the reaction is well removed from the stimulus.

Fortunately, since tick-related red meat allergy has become more common, allergists are more likely to connect this mysterious allergy with a recent tick bite. Once this allergy is suspected, doctors can perform a few simple tests to verify that red meat is the trigger.

The allergy seems to be a fairly recent phenomenon, since it was first described in a medical journal in 2007. Since then, the number of cases reported per year appears to be increasing, although this could be due to increased awareness and more accurate diagnoses. By the



The adult female lone star tick can be distinguished by the single white spot on the center of its back.

end of 2014, over 1,000 people in Virginia were known to have a tick-related allergy to red meat.

### The Lone Star Tick

The lone star tick is so named because the adult female has a single white spot on the center of her back. Adult male lone star ticks, on the other hand, feature white spots or streaks around the edges of their bodies. Adults are 3-4mm long, making them similar in size to the American dog tick. Other notable features of the adult ticks include

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## Hiker's Notebook: *Grifola frondosa*, Hen of the Woods

William Needham  
First Vice President

**Common Name:** Hen of the Woods, Sheep's head; Maitake (Japan); Klapperschwamm and Laubporling (Germany); Poule des bois, Pied de griffon, and Polypore en touffe (France); Fungo imperiale and Griffio (Italian) - The shape and the colors of the clusters of overlapping caps of the polypore fruiting body are suggestive of the feathers of a hen; the configuration also bears some resemblance to a Sheep's head.

**Scientific Name:** *Grifola frondosa* - The generic name is from griffin, a

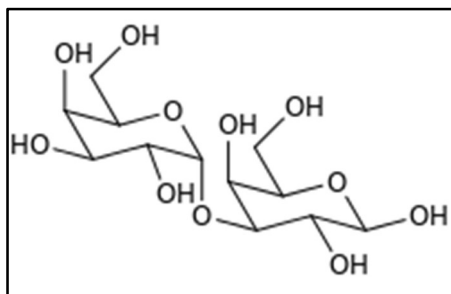
mythical beast with the head and upper body of an eagle with the lower body of a lion, popular in heraldry. The front legs of the griffin are typically depicted as being covered with the layered feathers of the eagle; the genus name was thus also chosen to reflect the avian appearance of the hen-of-the-woods (note that one of the French names is pied de griffon, foot of the griffin). This is etymologically ironic in that the name griffin is from the Greek word *grypos* which means curved, supposedly for the curved beak of the griffin. *Frondosa* is the Latin word for full of leaves, this to characterize the leaf-like caps of the fruiting body.

The Hen of the woods is an imposing polypore that can grow up to two feet in diameter

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The Hen of the Woods (*Grifola frondosa*) forms large rosettes at the bases of dead or dying trees, particularly oak trees.



Galactose-α-1,3-galactose (alpha-Gal) is composed of two sugar molecules linked together, making it a disaccharide.

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their eight legs and long mouthparts. Nymph and larval lone star ticks are much smaller and have fewer distinctive features.

Lone star ticks are aggressive and will feed on a wide variety of hosts. Possible hosts for lone star ticks include: domesticated animals, humans, birds that live on the ground (especially wild turkeys), and wild mammals of any size (particularly white-tailed deer).

The tick feeds on three hosts over the course of its life. First, a larva hatches from an egg and seeks out a

host by questing. While questing, the tick waits on a protrusion such as a leaf and attaches to the first suitable host that brushes up against it. The larva feeds on its host for one to three days before detaching and about a month later it molts to become a nymph. Nymphs quest, feed on a second host for three to eight days, and then detach and molt into adults after five to six weeks. Adults quest, feed on the third host for several days, mate with another tick on the same host, and finally detach to lay eggs. This life cycle usually takes two years to complete in nature.

The lone star tick is common in the eastern half of the United States. It is found from eastern Texas up to Nebraska and Iowa and all the way across to the East Coast. Along the Eastern Seaboard, its range extends northward into parts of every New England state.

The best way to avoid contracting this allergy or other diseases carried by

the lone star tick is by avoiding tick bites (for advice, see <http://www.cdc.gov/ticks/index.html>).

## Mechanism

Mammalian (red) meat allergy is triggered by the presence of a compound called galactose-α-1,3-galactose (alpha-Gal). This is a disaccharide (a chain of two sugar molecules) found on the muscle tissue of all mammals except primates.

It is thought that the lone star tick picks up alpha-Gal while feeding on a mammal. When the tick bites a human during the next stage in its life cycle, a small amount of this sugar is introduced to the blood stream.

Since alpha-Gal is

not found naturally in the human body, the immune system starts producing antibodies against it. The next time red meat is consumed, these antibodies recognize the alpha-Gal and trigger an allergic reaction.

## Symptom Management

The best way to manage symptoms of this allergy is by avoiding the trigger. This is easier said than done, since alpha-Gal can be found in many products that use ingredients derived from mammalian meat. Many sufferers will only react to red meat, but others will also react to milk, cheese, and yogurt products. Sometimes patients are so sensitive that they cannot eat meals prepared on surfaces that have also been used to prepare red meat.

People with this allergy may also react to products containing gelatin, which includes intravenous fluids, vaccines, and various food products. Certain medical procedures involving bio-prostheses can also be hazardous to sufferers.

There have been some reports that the allergy becomes less severe a couple years after the tick bite, but other people seem to have it for the rest of their lives. After the allergy is initially triggered, further bites by lone star ticks can make it more severe.

So far, attempts at desensitizing patients to alpha-Gal have been unsuccessful.

## Around the Globe

Cases of mammalian meat allergy associated with tick bites have been recorded all over the globe: there is at least one reported case from every continent except Antarctica. However, the only other place where this reaction is not rare is the east coast of Australia. There, red meat allergy is caused by bites from the paralysis tick (*Ixodes holocyclus*). The Australian form of this allergy is often more severe and longer-lasting than the American form. As in the United States, Australia has seen an increase in cases of tick-induced red meat allergy in recent years.

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## Fungi in the News

Thomas Roehl  
Newsletter Editor

*Editor's Note: This article contains summaries of the biggest fungus-related news stories from the second quarter of 2016. Visit the link following each topic below for a closer look.*

### A. bisporus Genetic Engineering

A Pennsylvania State University researcher has used the CRISPR/Cas9 gene editing technique to create a variety of the white button mushroom (*Agaricus bisporus*) that turns brown much more slowly. *A. bisporus* normally develops a brown color when it is injured and as it ages. Consumers tend to throw away mushrooms that have turned brown, so reducing browning can increase shelf life and allow the use of automation during harvesting. In the new variety, genes responsible for browning were deactivated using the CRISPR/Cas9 system. This highly-accurate genetic manipulation system was used to modify the fungus's genes without introducing any foreign DNA. *A. bisporus* is the first crop to be modified using this technique. The U.S. Department of Agriculture currently regulates only crops that have been modified to include DNA from other organisms. Consequently, the mushrooms can be produced and sold to consumers without having to comply with extra regulations for genetically modified organisms. Read more at: <http://www.nature.com/news/gene-edited-crispr-mushroom-escapes-us-regulation-1.19754>

### Smart Slime Molds

A recent study using the plasmodial slime mold *Physarium polycephalum* examined the ability of single-celled organisms to make rational decisions by using a modified "two-armed bandit" test. The slime mold was given a choice of two directions to explore, each with food spaced at regular intervals. One direction, however, contained more

patches of food than the other. The slime mold would first explore both directions before switching to a single direction. Most often, *P. polycephalum* would choose to stop exploring the direction with less food and focus its energies in the direction with more food. The cellular machinery that allows *P. polycephalum* to make rational decisions is not yet understood. Read more at: <http://www.njit.edu/features/innovations/garnier-slime-mold.php>

### Fungi Break Down Rocks

A new study looks at the mechanism that fungi use to extract nutrients from rocks. Researchers looked at the fungus *Talaromyces flavus* and its ability to remove iron from a rock called lizardite. *T. flavus* initially used a combination of acids to erode the rock and extract nutrients. When the surface ran out of nutrients, the fungus used acid and physical force to dig thin channels into the rock itself. Using this research, the authors of this study estimated that 40-50% of biological weathering of rock is caused by fungi, which is much greater than the older estimate of 1%. Read more at: <https://eos.org/articles/using-acid-and-physical-force-fungi-burrow-through-rock>

### Yartsagumba Harvest Decrease

Yartsagumba is the mushroom produced by *Ophiocordyceps sinensis* after it attacks and kills a ghost moth caterpillar. It is valued in China and elsewhere as a medicinal mushroom and an aphrodisiac. Harvested only in the Tibetan Plateau, the tiny mushrooms can cost over \$50,000 per pound. Unfortunately, the yartsagumba harvest has been decreasing in recent years, endangering the livelihoods of many people in that region. Mycologists studying *O. sinensis* suspect that overharvesting and climate change are responsible for the decrease in production. Read more at: [http://www.nytimes.com/2016/06/27/world/asia/himalayan-viagra-climate-change.html?\\_r=0](http://www.nytimes.com/2016/06/27/world/asia/himalayan-viagra-climate-change.html?_r=0)

### Plants' Responses to Climate Change Determined by Mycorrhizal Fungi

Research into how plants respond to climate change has returned mixed results over the years. A new study suggests that plants react differently primarily because of their mycorrhizal fungi. Arbuscular mycorrhizal fungi are less efficient at extracting nitrogen from the soil than are ectomycorrhizal fungi. Plants need nutrients in order to remove carbon dioxide from the atmosphere. As a result, arbuscular mycorrhizal plants cannot take advantage of extra atmospheric carbon. Ectomycorrhizal-associated plants, on the other hand, can remove extra carbon. Different ecosystems, therefore, have different capacities to absorb CO<sub>2</sub>. Understanding how different plants react to increased carbon dioxide will help researchers develop more accurate models to predict climate change. Read more at: [http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news\\_30-6-2016-12-25-24](http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_30-6-2016-12-25-24)

### Deadly Yeast Spreading

The Centers for Disease Control and Prevention (CDC) warned hospitals and other health centers in the United States to watch for *Candida auris*, a pathogenic yeast that is resistant to common antifungals. *C. auris* grows and spreads easily in hospitals, which is primarily where it infects patients. Unfortunately, most U.S. hospitals do not have the ability to readily identify this species of *Candida*. Once *C. auris* is found, hospitals can eliminate it by isolating infected patients and thoroughly cleaning rooms with a suitable antiseptic. While the organism has not been definitively identified in the U.S., the CDC warned that it will likely spread to America. Read more at: <https://www.washingtonpost.com/news/to-your-health/wp/2016/06/29/a-deadly-drug-resistant-yeast-infection-is-spreading-around-the-world/>

# Events

## Meeting Files

### May 3: Peter McCoy Shares Insights from *Radical Mycology*

Thomas Roehl  
Newsletter Editor

On May 3, Peter McCoy shared with MAW some of the insights from his recently-published book, *Radical Mycology: A Treatise on Seeing & Working with Fungi* (available through <https://radicalmycology.com/>). While researching his book, McCoy studied many scientific papers and

experimented with culturing techniques. This research provided the basis for his lecture, which covered a wide range of mycological topics, from fungal evolution and ecology to ethnomycology and cultivation.

McCoy began his talk with an overview of fungal evolution. Fungi, he says, most likely evolved to consume dead bacteria. Fungi then evolved to decompose a wider variety of organic material and eventually branched out to fill multiple ecological roles. Today, fungi are important for maintaining earth's nutrient cycles. To McCoy, "fungi are the great progenitors and stewards of life."



Thomas Roehl

Peter McCoy describes the past, present, and possible future of human interactions with fungi during MAW's May meeting.

McCoy then embarked on an overview of ethnomycology, or how humans relate to fungi. The first evidence of humans using fungi comes from the "Red Lady," who was buried in Spain 18,700 years ago. Scientists found agaric and bolete spores on her teeth, possibly indicating that mushrooms were used in ancient ceremonies. Since then, humans have learned to use fungi for beer, wine, bread, medicine, dyes, and numerous other uses.

The next step for humanity was to cultivate the mushrooms around them. McCoy explained that mushroom cultivation began in China around 1,000 B.C.E. More recently, Western cultures developed laboratory cultivation standards to grow a wider variety of fungi. The traditional way of cultivating mushrooms involves growing the fungal mycelium on agar, then transferring it to grains and finally to straw. Unfortunately, this process is prone to contamination. McCoy prefers to use a liquid culturing method where syringes are used to inoculate jars of culture media. The use of syringes helps keep out contaminants and makes it easier to successfully culture a fungus.

Finally, McCoy described new uses that humans have found for fungi. The one that he finds most exciting is using fungi for bioremediation. Fungi like *Pleurotus ostreatus* can eat over 200 agricultural byproducts. Other fungi can decompose and/or accumulate toxic substances like benzene ring-based molecules and heavy metals. Fungi can also be used as natural alternatives to agricultural fertilizers and pesticides. Additionally,

## Upcoming Events:

Consult the "Upcoming Events" page on [www.mawdc.org](http://www.mawdc.org) for the most current schedule of events and to keep up with any changes.

**July 22-23** – Dry Fork, WV Foray: This weekend foray is hosted by the West Virginia Mushroom Club. Visit <http://wvmushroomclub.org/> for more information and to register.

**Aug. 2** – Monthly Meeting: MAW members will lead an introduction to mushroom identification. Bring a field guide and any mushrooms you have to practice identification techniques.

**Aug. 27, 2-4PM** –Tasting Meeting: Come sample mushroom dishes prepared by MAW members. This meeting will be held at the Sandy Spring Museum, 17901 Bentley Road, Sandy Spring, MD 20860. Space is limited, so it is only open to MAW members. You must register in advance through [www.mawdc.org](http://www.mawdc.org) in order to attend. Cost is \$10 per person but is free for those bringing a dish. Wild mushrooms used in dishes must be identified by an official MAW identifier beforehand. More information will be provided to members on the website, at meetings, and through email. Contact Corinne Weible at [culinary@mawdc.org](mailto:culinary@mawdc.org) with any questions.

**Sept. 6** – Meeting replaced by August Tasting Meeting.

**Sept. 8-11** – NAMA Foray: This year's North American Mycological Association (NAMA) annual Foray will be held at the NoVA 4-H Center in Front Royal, VA. Limited space is still available for this event. Register for the foray through NAMA at [www.namyco.org](http://www.namyco.org). Registration ends on August 1 or when all spaces have sold out. Only members of NAMA can attend this foray. You can join NAMA through its website. MAW members get a discount on NAMA membership.

**Sept. 23-25** – MAW weekend foray at Camp Sequanota in Jennerstown, PA. This foray is MAW's most enjoyable fall event! The club has returned to Sequanota every fall for over 25 years!

**Oct. 4** – Monthly Meeting: Guest speaker will be Alan Sondheim.

**Oct. 9** – MAW Mushroom Fair at Brookside Gardens. Volunteers are needed for this event. Contact William Needham at [vicepresident@mawdc.org](mailto:vicepresident@mawdc.org) to volunteer.

Unless otherwise noted, monthly meetings will be held on the first Tuesday of the month at 7:00 PM in the Kensington Park Library, 4201 Knowles Avenue, Kensington, MD. Attendees are encouraged to bring mushrooms for sharing and identification. Members of the public are welcome to drop in.





Dr. Cathleen Clancy explains how the Poison Center handles cases of mushroom poisoning.

mushrooms grown on things like invasive weeds, coffee, and cardboard can be used to help reduce waste. 🍄

## June 7: Dr. Clancy Talks Poison Centers, Mushroom Poisoning

Thomas Roehl  
Newsletter Editor

The June 7 meeting featured Cathleen Clancy, M.D. an Associate Medical Director of the National Capital Poison Center. Dr. Clancy explained the role of the National Capital Poison Center in responding to mushroom poisoning. The National Capital Poison Center serves the Washington, D.C., area by providing training, diagnostic information, and on-call treatment advice. The center also tries to prevent poisonings by educating the public about common poisons.

In the United States in 2014, the last year for which data is available, there were three fatalities caused by mushroom poisoning. There were also 37 incidents of severe mushroom poisoning and 406 minor incidents. On top of that, Poison Centers across the country received 6,000 mushroom-related calls. However, Dr. Clancy pointed out that less than 0.5% of mushroom poisonings are called in to a Poison Center.

Mushroom identification is important for timely and effective treatment of poisoning, but it is usually impossible to get an accurate identification. As Dr. Clancy explained, the process of mushroom identification is too complicated for the general public. Ideally, the Poison Center would have a photograph, spore print, and

sample of the mushroom. Unfortunately, it is hard to explain how to take a spore print over the phone and the sample of the mushroom is usually not the same mushroom that was eaten. On top of this, Dr. Clancy lamented that most “[Emergency Room] people don’t even know to ask about mushrooms.” All of these things greatly slow down identifying the cause of the symptoms in cases of mushroom poisoning.

There are at least 14 types of mushroom poisoning, though most poisonings are caused by just a few types. The majority of people suffer gastrointestinal distress that is not life-threatening but sometimes requires hospitalization. Most fatalities are caused by amatoxin poisoning, which destroys liver and kidney cells. The most dangerous toxins, like amatoxins and orellanine, have a delayed onset of symptoms that makes it difficult to identify the cause of poisoning.

Treatment varies based on the type of mushroom poisoning. A course of treatment that works well across multiple types is to have the patient drink activated charcoal to bind any toxins still in the gut. This is coupled with giving the patient a fluid and electrolyte mix to treat dehydration (due to vomiting and diarrhea, which are symptoms of most types of mushroom poisoning). 🍄

## July 5: Patrick Leacock Describes American Chanterelles

Thomas Roehl  
Newsletter Editor

Patrick Leacock, an Adjunct Curator at the Field Museum of Natural History in Chicago, Illinois gave a presentation during the July 5 meeting in which he described North American chanterelle diversity and his work on identifying a new species of chanterelle in the Chicago area.

Leacock spent the past few days collecting mushrooms in the Washington, D.C. area and identified four species of chanterelles:

*Cantharellus lateritius*, *C. minor*, *C. cinnabarinus*, and “*C. cibarius*.” The fourth species most closely resembles the European *C. cibarius*, but is most likely an as yet undescribed species. This situation is typical of chanterelles in both North America and Europe, since mycologists are finding that most current definitions of chanterelle species actually lump together multiple species.

Thanks to modern DNA sequencing techniques, the decades following the year 2000 saw a spike in the number of described *Cantharellus* species. In North America, there are now 23 species in the genus *Cantharellus*, and this number is likely to go up. Recently, five new species were described from Texas and in 2013 three new species were described based on collections from a small area in Wisconsin. A few chanterelles with very northerly ranges can be found in North America, Europe, and Asia, but this does not include *C. cibarius*.

Leacock’s work on chanterelles was primarily conducted in the Chicago region. In addition to nine species found elsewhere in North America, Leacock discovered that DNA and morphological differences in some of his collections were significant enough to define a new species of chanterelle: *Cantharellus chicaoensis*. This chanterelle was the most common species in the Chicago area and is characterized by its medium size (compared to other chanterelles), lack of odor, growth under oak, greenish margin when young, and red staining. Leacock also collected some albino forms of *C. chicaoensis* that were much paler in color. 🍄



Patrick Leacock describes the chanterelles found in North America and helps identify the mushrooms at the meeting.

# Mushrooms

## Chicken of the Woods Satay

### Marinade Ingredients:

½ can Thai coconut milk or cream (Chao Koh and Chef's Choice are good brands)  
1 T. powdered turmeric  
2 t. ground coriander  
1 t. cumin  
1 T. garlic powder  
1 t. salt

### Other Ingredients

1 to 1½ pounds young, supple, moist chicken of the woods (*Laetiporus sulphureus* or *Laetiporus cincinnatus*), sliced or broken into strips about ¾ inch wide  
bamboo skewers, soaked in water  
1 can of chicken or vegetable broth

### Sauce Ingredients:

1-½ cans Thai coconut milk or cream  
1 T. vegetable oil  
1 heaping T. Thai curry paste (panang is best, available in Maesri and Lobo brands, or red curry if you can't find panang, available in those two brands plus others)  
1 T. tamarind concentrate paste (Tamicon is a brand found in Indian grocery stores)  
2 heaping T. peanut butter  
juice of 1/2 lemon  
1 t. MSG or salt  
1 T. palm or light brown sugar

[Recipe provided by Jon Ellifritz]

### Directions

First (or before freezing the "chicken"), bring the broth to a boil in a pan big enough to hold the mushroom strips. Turn down the heat, add the mushrooms, and simmer for five to ten minutes (making sure all the mushroom is kept moist through swirling the broth around a few times). After thawing (if pre-simmered and frozen before) or simmering, drain off the broth and add the already-mixed marinade ingredients. Gently stir the mushroom strips with the marinade to ensure maximum coverage and put the container in the refrigerator for about an hour. You can now make the sauce while the mushroom is marinating (and the marinade is thickening).

In a medium to large frying pan, fry the curry paste in the oil for a few minutes to bring out the aroma and flavor of the spices. Add one full can of coconut milk or cream and simmer for several minutes until oil starts to separate from the rest of the coconut milk. Gradually stir in the peanut butter, tamarind concentrate, lemon juice, MSG or salt, and sugar. A slotted spatula works well to do this. From this point on, it's a matter of adding little bits of this or that to ensure a pleasing balance of four flavors: heat or spiciness from the curry paste, sour from tamarind or lemon juice, sweet from the sugar, and savory or "umami" from the peanut butter. After reaching a preferred balance, keep the sauce warm until ready to use, then stir in the other half can of coconut milk and warm a bit more.

Once the sauce is nearly ready, you can finish cooking the mushroom. Carefully thread the strips onto the bamboo skewers (the simmering should have made the strips limber enough to minimize breakage). You can then grill them over charcoal, in a grill pan, or under the broiler, turning them once. Baste them with any remaining marinade and grill them only long enough to put a slight char on them since the simmering in broth should have cooked them enough. Serve the skewers with enough of the sauce over the top or at the side. Any excess is traditionally sopped up with toast points, and the satay may be served with a salad of finely sliced cucumber, shallots, rice vinegar, and a little sugar, or even with some finely sliced Thai chilies.

Remember that a few individuals are sensitive to some compound in at least some species of chicken of the woods.

## Morel Season Recap

Tim Geho

Former MAW Member, Morel Expert

The 2016 morel season wasn't much to remember, but I'll give my thoughts on it. Morels were extremely scarce. As noted in my talk to MAW and follow up paper, one of the main things required for a good morel year is the amount of rain in the several weeks leading up to the normal start of the season. Rain was scarce in Front Royal for the month prior to what I feel are the normal start dates of around 4/20 to 4/25 for the Front Royal to Luray region. Front Royal only had .44" of rain in the prior 30 days. Considering that both the morel mycelium and plants were competing for this scarce moisture, there just wasn't enough to go around. In times of stress the morel uses food and resources stored in its sclerotia to help sustain the mycelium rather than to produce morel fruiting bodies. I could find very few places that had any indication of moisture in the top several inches of soil. The way plants and trees grew this spring varied greatly across the area. We saw irises that had finished blooming when we arrived and in other areas some had not yet bloomed by the time we left. The leaves on trees came out in similar inconsistent patterns. Most leafed out very slowly, which is not good for morel food deprivation, my main theory on what makes for good fruiting years.

The temperature was fairly warm toward the end of March and then it cooled down with very cool high temperatures due to 17 straight days of rain. I feel the rain came too late and too often to make the morels fruit and hindered many that tried to fruit. The small *Morchella deliciosa* type push up through or between the leaf cover on the ground; but the rain made the leaves stick together, making it hard to impossible for many to show themselves. I found quite a few that managed to push partially up at severe angles or were just lumps under the leaves. Those that did fruit were quickly decimated and began to spoil within one day



Thomas Roehl

Morels were very scarce during the 2016 season.

due to the rain. I had to toss many that my wife Judy and I picked because they collapsed in our collection bags. The largest cluster I found had only 10, while in good years 20-50 or more can often be found in a small group or area.

The fruiting of the larger *M. esculenta* type was not much better, but some were there to be found if one was lucky enough. I know of many trees that always seem to produce morels every year. For example, one tree that usually produces 8-12 in a good year and more in a great year had only one this year. This was typical of most trees and areas we hunted. We did manage to find 3 lbs. one day and 2.5 lbs. another day, but we left at least as many that were too old or water-damaged on those days.

I was lucky enough to find 5 very large ones that weighed in at 1 pound in an area close to a known good spot but where I had never found any before. As I have noted in the past, make sure to look all around: you never know where you may find morels.

In 3 weeks Judy and I did manage to collect about 12 pounds but had to do a lot of walking and looking to find them. Some days we only found them in single numbers such as 6, 15, 12, etc. One thing may lead to some good finds but be detrimental in the long run is becoming pretty evident: Ash trees are being killed by the Emerald Ash Borer (information at: <http://www.annualreviews.org/eprint/vSWypwJbBdPxDD3sam3r/full/10.1146/annurev-ento-011613-162051>). A newly-dead Ash tree can have a good fruiting, similar to a newly-dead Elm.

All in all, it doesn't matter how much one thinks one knows about when, why, and where morels fruit: if the conditions aren't right, few will be found. This is 2 years in a row that we've had below-par pickings and I hope next year will make up for them. 🍄



## Hen of the Woods

Continued from Page 1 and weigh up to 80 pounds, though sizes of six to twelve inches in diameter and 4 to 6 pounds are more common. It is saprophytic, growing on stumps or at the base of dead or dying deciduous trees, notably oak. It is one of the most delectable of the edible fungi; its numerous names in diverse languages testify to its universal notoriety and appeal.

The Japanese name for Hen of the woods is Maitake, a combination of the words *mai* which means dancing and *take* which means mushroom. The probable etiology of the name "dancing mushroom" is that the caps or leaves of the fruiting body resemble dancing butterflies, a popular Asian cultural metaphor. An alternative theory holds that the lucky mushroom hunter who found a Maitake would literally dance with the joy of discovery and in anticipation of a uniquely satisfying gastronomic experience. The latter has some merit as *G. frondosa* has been lauded as near-ambrosia in Japan and China for millennia; while finding it in spite of its relative scarcity may have elicited a mushroom dance celebration. The Maitake was so revered in Japan that it was worth its weight in silver; it was offered to the Shogun by the local warlords as a special gift.

Like most edible fungi, *Grifola frondosa* is nutritious, containing significant amounts of proteins, vitamins and minerals. Since it is mostly water (91 percent), its constituents are accordingly determined and reported as a percentage of dry weight. The protein content of 19.7 percent is about average compared to other edible fungi; the button mushroom (*Agaricus bisporus*) is somewhat higher at 27 percent while the wood ear (*Auricularia auricula*) is significantly lower at 4 percent. The type of protein is more important, however. Adults need 8 essential amino acids, those that must be ingested directly and cannot be concocted from other constituents. Those commercially grown mushrooms that have been



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The underside of each frond of the Hen of the Woods is covered with angular pores.

analyzed have all eight essential amino acids; it is likely that Maitake does as well. It has significant amounts of vitamins B<sub>1</sub>, B<sub>2</sub>, ergosterol (provitamin D), potassium and phosphorous.

*Grifola frondosa* has been used in traditional Asian medicine for centuries to promote general health and vitality by enhancing the responsiveness of the immune system. In the early 1980's the Japanese mycologist Hiroaki Nanba of the Pharmaceutical University of Kobe began investigating the Maitake to determine the chemical nature of its alleged medicinal properties. Based on the extraction of various polysaccharides and animal testing for antitumor and immunological effects, he concluded that one polysaccharide subsequently named beta-D-glucan was particularly adept at stimulating macrophages and killer cells. Maitake is currently under review for the treatment of cancer, diabetes and Acquired Immune Deficiency Syndrome or HIV-AIDS.

Human clinical studies are in progress to evaluate the efficacy of beta-D-glucan, also known as the D-fraction, in the treatment of breast and colorectal cancer. This trial is a consequence of successful animal laboratory trials in which mice were treated with either a carcinogen for urinary bladder carcinoma or the carcinogen and Maitake extract. Those that were subject to the carcinogen alone all had bladder carcinomas, while less than half of those treated with beta-D-glucan were cancerous. Trials with diabetic laboratory mice also demonstrated that Maitake lowered their

## Mushroom Tasting Meeting!

**WHEN:** August 27, 2-4PM

**WHERE:** Sandy Spring Museum

17901 Bentley Road, Sandy Spring, MD 20860

[www.sandyspringmuseum.org/](http://www.sandyspringmuseum.org/)

**COST:** \$10 for MAW members

**FREE for those bringing a dish**

The only way to know if you like a mushroom's taste is to cook it the right way and eat it! This tasting event will feature mushroom-based cooking – delicious and educational at the same time! Come taste mushrooms you have never tried before and compare the results of different mushroom preparation and preservation techniques. Participants will vote for the best preparations and we will share our recipes.

- 🔗 Space is limited, so you must register beforehand! Visit <https://mawdc.wildapricot.org/event-2284310> to register.
- 🔗 Cooks will receive more instructions by email. Notify Corinne Weible at [culinary@mawdc.org](mailto:culinary@mawdc.org) when you know what you'll cook.
- 🔗 All wild foods must be inspected by an official MAW identifier before being cooked.
- 🔗 Get more details through MAW's website, emails, and meetings.

blood glucose levels. It is hypothesized that a second high-molecular polysaccharide called the X-fraction is responsible for the reduction in insulin resistance. The ability of the D-fraction to stimulate macrophages that are important in the operation of the immune system led to its consideration as a potential AIDS drug. Studies are in progress at the Memorial Sloan-Kettering Cancer Center in New York and other institutions to determine the efficacy of the D-fraction of the Maitake in this application. 🍄

