

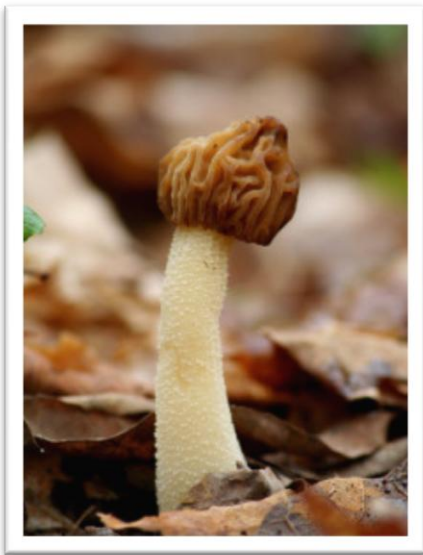
Spores Illustrated

Morel Hunting in New York

Text and photos by Peter J. Russell

Living in Southern England I had some ideas of where to find morels, which if not scientific, did bring some success when hunting them. Yellow Morels (*Morchella esculenta*) and Semi-Free Morels (*Morchella punctipes*) could be found in woodland on the chalk or limestone, Black Morel could appear in wood chips and other man-made habitats, whilst the False Morel (*Gyromitra esculenta*) could appear in woodland on acidic soils

But it didn't take long during my first season in New York to realize things were very different. The morels I was finding just didn't look like the ones back home and I was finding them in places I never expected them to be. After seven seasons in the US I still find them confusing! One big problem with morels is that the same species can take on different appearances depending on environmental variables such as the amount of sunlight, warmth, and humidity, so that different species overlap in appearance and can look the same.



Half Free Morel - *Morchella punctipes*

In fact it has been said that over 100 morel species have been described based on their morphological features such as the color of ridges, pits, and stem; the arrangement of the ridges; and attachment of the head to the stem. Terms such as Black, White, Grey, or Yellow are still used today when perusing people's posts on the web during morel season.

Recent molecular studies have shown some of these morphological forms are not separate species but rather variation within a species. But that has not helped in making identification any easier. There are 20 or more species of morels in North America described on the basis of molecular studies, a diversity that indicates this is the ancestral home where they first evolved. Some of these species are virtually indistinguishable in the field. In the New York area there are about 5 species that may be found, but there are others recorded in close geographical proximity so this may change. In general it is easy to separate morels into one of 3 main groups: the Yellows, the Blacks and the Half Frees. Getting down to the species can prove frustrating.

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Spores Illustrated is the newsletter of COMA, the Connecticut-Westchester Mycological Association.

The morels I am referring to are the True Morels. The Verpas, as well as the Gyromitra (False Morels), produce spores over the whole cap surface whereas the true morels produce spores only in the pits of the cap and not the ridges.

A simpler distinction is that true morels are completely hollow and the caps are attached to the stem at least halfway up.

True morels are in the genus *Morchella* (although in Europe the Half-Free Morel is often put into its own genus- *Mitrophora*)

Kingdom: Fung; Phylum: Ascomycota; Subphylum: Pezizomycotina; Class: Pezizomycetes; Order: Pezizales; Family: Morchellaceae; Genus: Morchella (true morels)

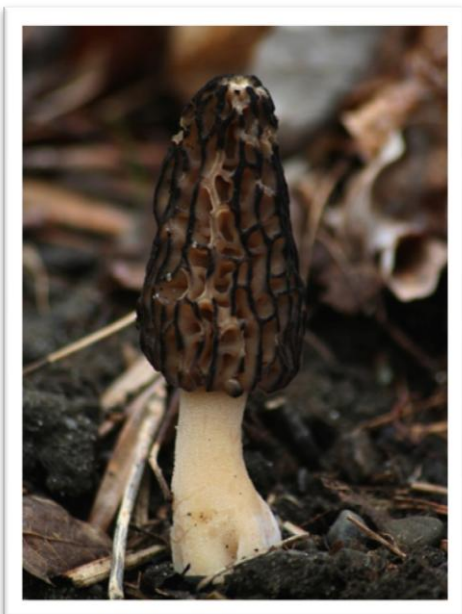
The Half-Free Morel (*Morchella punctipes*) is fairly distinctive in that the cap is attached to the stem about halfway up with the lower part of the cap hanging free. The caps of other true morels are attached to the stem at the bottom of the cap. Like the other true morels it is completely hollow. One species is currently described in New York, not the same species as that found in the UK where it is often put into its own genus (*Mitrophora semilibera*).

The Black Morels are distinguished by their ridges which are pale when young but begin to darken and turn black as they mature (unless covered by leaf litter); where the cap meets the stem there is a shallow groove; and ridges are arranged vertically once mature. Their appearance changes as they mature and if it was not for time lapse photos in Michael Kuo's morel book, I would never have realized they were the same species!

The most cosmopolitan Black Morel is *Morchella angusticeps* and that is how we describe those found in New York. However there are other species that have been recorded nearby: another form with distinct DNA, but morphologically identical, has been recorded from New Jersey to Oregon. A smaller species (*Morchella septentrionalis*) has been recorded above the 44th parallel



Thimble Fungus (Verpa conica)



Both pictures are of Black Morels (*Morchella angusticeps*) – the one on the left is young, the one on the right is mature. Note the darkening of the ridges as they age.



Morchella angusticeps does not behave in New York like the Black Morel (*Morchella elata*) I was used to in Southern England. Here it is found in a diverse range of habitats including under Tulip and Ash trees along with Yellow Morels. Only out in California does a version, the Landscaping Morel, seem to favor the same man-made habitats.

The Yellow Morels differ from the Black Morels in that their ridges do not darken with age and there is virtually no rim where the cap meets the stem. There are at least 5 species of Yellow Morel and several are likely to be found in the New York.



Morchella diminutiva, a version of the tulip morel but found under other trees.

One group of Yellow Morels are what were previously described as gray, small yellow or tulip morels. These are the smaller morels I was finding on my first forays. As well as being smaller with sparser pits and ridges that are more vertically arranged, they are often more often conical in appearance - apart from the pale ridges they look similar to the Black Morels.

The species *Morchella diminutiva* is found in New York and can be found under a variety of trees, not just tulip trees. Another more southern species, *Morchella virginiana*, is very similar, although a little larger and is restricted to tulip trees.

The classic Yellow Morel found in New York is *Morchella americana* that is similar to the European *Morchella esculenta*. The cap can be quite large - up to 20 cm long - and is generally rounded rather than conical. Other species that look identical, such as *Morchella cryptica* have been recorded further west

Distinguishing the Yellow Morels can be very confusing as a young *Morchella americana* will start out small and can be very difficult to distinguish from *Morchella diminutiva*.



A mixture of Morels collected under tulip trees. Are these *M. diminutiva* or small *M. americana*?

Morels have proved just as elusive a quarry in New York as they did in England, but one of the surprises is finding all 3 types growing in the same habitat along with *Gyromitra korfii*. Based on my English experiences I expected to find Yellow Morels growing in sweet soil, but the best find I ever made was on very sandy soil under pine. Although there seem to be as many opinions about where to find them as there are potential habitats, I find the best way to find them is to go on a COMA foray and let others find them for me!

[Peter's article first appeared on his blog www.givemewildernessanyday.com]

*NEMF Reflections:
What are Fungi?*

Article by JJ Murphy

In the previous issue of *Spores Illustrated*, I wrote about how I spent my time at the 2104 Samuel Ristich NEMF Foray. Thank you, COMA. I do try to learn something about the vast and ever-changing fungi kingdom. But I confess, when I go to a foray I also look forward to three days of doing what I love most: wandering the woods discovering mushrooms, spending time in the sorting room with the mushrooms that have been identified, and eating mushrooms.

I never met Sam Ristich, but watching videos of his persistent curiosity, his sense of childlike wonder, and his boundless joy makes me grateful for his legacy which for me, defines the community of mycologists. I'd list my honor roll of rock stars of the fungi world, but I'm afraid I'd leave someone out. It's as if Sam's spirit touches everyone.

It was a treat to be out in the Maine woods. It had been a long time since I'd been that far north. Black trumpets and chanterelles were abundant. It was a giddy time. The evening presentation that I worked hardest to understand was Raymond Archanbault's, "Lost in the World of Fungi."

The idea that the fungi kingdom may share more traits with animals than plants seems like a radical idea. Last issue I wrote:

"Lost in the World of Fungi" accurately describes how I feel when trying to grasp patterns of diversification or how mushrooms may have more in common with animals than plants. I am grateful to those analytical minds dedicated to sorting out these mysteries and sharing their discoveries with the rest of us.

This is where I stare at my notes in confusion. I can read my notes, but what exactly does it mean that fungi produce chitin in their cell walls and animals produce chitin in the form of exoskeletons of insects and crustaceans? In the category of food, "heterotrophic" means absorption when applied to fungi, but it means ingestion when it comes to animals; plants process food by means of photosynthesis. Are there more points of similarity between fungi and animals than there are between fungi and plants? It's enough to make me wander back out into the woods to harvest more edibles.

Since I wrote those words, I hope I am correct in my interpretation of one or two basic concepts that appear to be commonly accepted. I stared at those charts and

eventually noticed that fungi have some features in common with plants and some features that are more like animals.

I originally joined COMA because I wanted to learn to identify edible mushrooms. I have benefited from so much more because of our dedicated members who nurture Mushroom University, COMA's full walk schedule, a pot luck banquet that can't be beat, and the best foray, especially for an individual club. The scholarship is icing on the cake and I hope my contributions to COMA are worthy of your faith in me.



Oyster mushrooms (Pleurotus ostreatus) are both decomposers and predators of nematodes. (Photo by qwert1234)

I am blessed and lucky to be in the presence of mycologists who are patient as I learn to see in a more discerning way. I am in awe of this community of people who not only see patterns and possibilities in the fungi kingdom that I never even thought about, but find ways to make it understandable.

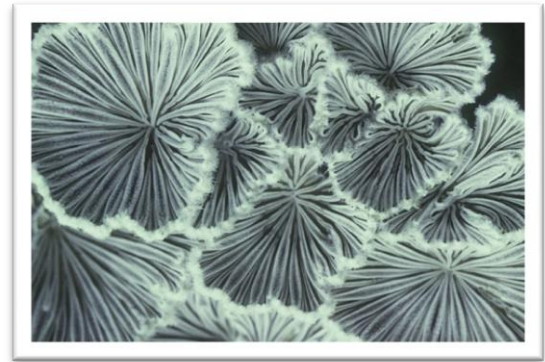
Mycology continues to change the way I look at the world and the way I think about the world. Beyond being food and medicine, the fungi kingdom offers endless possibilities including study of how elements of an ecosystem are interrelated, options for building materials, and effective bio-remediators.

Yeah, I'm hooked on fungi.

[J.J. received a 2014 Sylvia Stein scholarship to attend the NEMF foray in Maine. She writes a blog at www.thejoyfulforager.com –ed.]

My Trip to Japan – A haiku
Taro letaka

Fungi of Tokyo:
Schizophyllum commune.
That is all I found.



Schizophyllum commune (Photo by SAB ATH on commons.wikimedia.org)

UPCOMING COMA PROGRAM

Thursday, June 11; 7:00pm

[The Evolution of Mushroom Cultivation in the Northeast](#)

John Michelotti

Outdoor log mushroom cultivation is taking the Northeast by storm. Projections estimate that there will be four times as many mushrooms grown on logs in three years than there are today. Why are people getting excited about mushrooms all of the sudden? What is this growing mycelial wave about? Could this lead to a shift in how we view mushrooms in American culture? Is there a mushroom behind me, right now?! All these questions will be answered and more during John Michelotti's presentation on "The Evolution of Mushroom Cultivation in the Northeast"

COMA programs are held at the [Friends Meeting House](#) in Purchase, NY (Route 120 near intersection of E. Lake Street).

Why Mushrooms?

John Michelotti

People ask: Why Mushrooms? Why, out of all the things in the world to learn about, what's so special about mushrooms?

It always excites me to broaden their horizons with ideas of the vast unknown in the scientific world when it comes down to the number of named and identified mushrooms as well as the 90% of unnamed fungi that are out there. This is the kingdom with the largest living organism on the planet. I may tell them how mushrooms have improved lives through their medicinal uses, taken lives with their deadly poisons, and changed lives with the ones in between. I delight in enlightening them with ideas of glow in the dark mushrooms and how spores can potentially travel through space within rock and ice of meteorites and colonize other planets. How there are spores in every breath you take. Fungi connected to or inside of plants play vital roles in trans-locating nutrients or decomposing the plants to create rich soil - in some cases the same fungus fills both roles.

Who cares? What can these fungi do for me? From an anthropocentric point of view, mushrooms may help heal you when you are sick. Different fungi may have potential in battling ailments from the common cold to cancer. Last year Mycology Press released the second edition of *Medicinal Mushrooms: A Clinical Guide* by Martin Powell. It not only talks about the pharmacological active compounds such as proteins, triterpenes, phenols, sterols, statins, enzymes, and polysaccharides; it focuses on 19 mushrooms, 15 types of cancer they may aid, and 38 other medical conditions which have been helped by mushrooms.

I know what you're thinking: Show me the money. Who says money doesn't grow on trees? It does! In the form of mushrooms. Shiitake log cultivation is a booming industry in agriculture today, especially across the northeast. Steve Gabriel and Ken Mudge released a book last year called *Forest Gardening* which compiles over a decade of research done by Cornell University. Chatham University released results from a survey entitled "Forest Grown Shiitake Production in the Northeast" and found the 51 producers with mushroom logs for sale in 2014 had a combined 17,968 inoculated logs, or bolts, that would yield a total of 10,567 pounds of shiitake mushrooms. The farmers were estimated to make an average of \$5,637 this year, totaling \$287,488. The farmers interviewed are projecting to expand their production to 59,575 bolts by 2018 which would result in a total revenue of \$655,352. This is only a projection of the existing growers and does not include the future growers that are learning about the powers of inoculation now. Cornell Cooperative Extension has been hosting shiitake log inoculation classes

across New York State for the past four years and interest has been very high. The demand for mushrooms from restaurants, stores, and farmers markets is greater than the current supply so the industry can handle this growth. A survey in 2014 showed that 89% of growers' markets are greater than their supply.

This demand is testament to a changing culture around mushrooms in North America and the world. Mushrooms of the future will no longer be something that parents tell their kids "don't touch it, it will kill you" but instead ask "what kind is it?" This is because mushroom walks are filled with kids and home-schooling parents, schools are learning to grow mushrooms as they get creative with their school gardens by using cafeteria scraps as growing medium. Entrepreneurial teens are getting press for cultivating mushrooms in



The Turkey Tail (*Trametes versicolor*) is both a decomposer and one of the most promising medicinal mushrooms. (Photo by Jerzy Ostiola)

their dorms/apartments and not just in the police blotter. Graduate students are taking off with their mushroom experiments, gaining grant money, and starting booming companies from their fungal innovations. Mushroom growing initiatives have sprung up in India, around Africa, Haiti and other countries as a low energy, effective way to feed people with available resources.

Some people speculate that hallucinogenic mushrooms were the catalyst for human evolution. Psilocybin inhibits the inhibitors in the brain. The theory is that primates eating psilocybin would be able to see, smell, and hear better, and therefore hunt and gather more efficiently. I do not know if mushrooms have helped us evolve in the past but they seem to be important in the great growth of our future.

John Michelotti would like to thank the COMA members and chair holders for their generous contribution of the Sylvia Stein Scholarship which he received last year that made it possible for him to attend the 2014 Clark Rogerson Foray. John is working on editing a video to capture the memories and special moments from the foray which he will make available to COMA members in a future newsletter.

COMA officers and committee members are:

<i>President</i>	Taro letaka (COMApresident@comafungi.org)
<i>Vice-president</i>	Joe Brandt (jlbco@hotmail.com)
<i>Secretary</i>	Stephanie Scavelli (COMAnews@comafungi.org)
<i>Treasurer</i>	Don Shernoff (donshernoff@yahoo.com)
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<i>Spores Illustrated</i>	Taro letaka
<i>Rogerson Foray</i>	Don Shernoff, Diane Alden (daldenpc@verizon.net), Carol McLeod, Taro letaka, Joe & Kathy Brandt
<i>Scholarships</i>	Sue Rose (chair) (susanmbrose@gmail.com), Rena Wertzer (renawertzer@hotmail.com), Stephanie Scavelli
<i>Programs</i>	David Rose (tomashunders@gmail.com), Rena Wertzer, Lisa Solomon, Joe Brandt
<i>Mushroom U.</i>	Carol McLeod
<i>Rules</i>	Morris Palmer (morrssarian@msn.com)
<i>Hospitality</i>	Jen Keane (nykeane@aol.com)
<i>Past presidents</i>	David Rose, Morris Palmer, Dianna Smith (diannasmith1@me.com), and Sandy Sheine

Upcoming forays

37th Annual Clark Rogerson Foray
Friday, Sept. 4–Monday, Sept. 7, 2015
Berkshire Hills Eisenberg Camp, Copake, New York

This year's foray features Gary Lincoff as our chief mycologist, along with Bill Yule, Roz Lowen, Leon Shernoff, and Dianna Smith. More info at www.comafungi.org

39th Annual Northeast Mycological Federation

Sam Ristich Foray
 Thursday, July 30th - Sunday, August 2nd 2015
 Connecticut College, New London, CT
 Info at www.cvms.org/nemf.html

Can you guess the mushroom in this 1889 illustration?

