NovDec, 2019 Volume 47 Issue 6

Ohio Mushroom Society

The Mushroom Log

Report on the Summer Foray

Mushroomers gathered at 9 am for a light breakfast. The first foray began at 10 am to Penitentiary Glen and nearby Chapin Forest Reservation. Collectors retrieved a surprising array of species, given the relatively dry conditions. Cathy Pepera had stepped in as the hostess, organizing, and gathering breakfast and lunch items. After the usual great collections of homemade dishes members made, we reconvened to hear John Plischke present a talk/slide show, entitled Edible Mushrooms How to Find, Prepare, and Cook them. He told us of truffles imparting their wonderful flavor to other foods which are put in the same container for an extended period. He distinguished between Boletus edulis and B. seperans. He uses binoculars to determine if it is edulis and in good shape. After the pm forays, we enjoyed the Table Walk(s), three of them actually. Django Grooitmyer pointed out two pathogens, namely the tar spot on maple leaves and Alternaria on tomatoes.

John Plischke emphasized the fact Laetiporus shelves could be depressed by one's fingernail. Walt Sturgeon concentrated on mush-rooms like Tylopilus alboater, the Bradley, which smells like fish, any Lactarius which lack hot flavor are edible. We adjourned at 6:30 pm for dinner at Tavern Six.

Species List for Summer Foray collected from Penitentiary Glen Nature Center and Chapin Forest, both of Lake Metroparks, Lake Co., OH.

Abortiporus biennis
Alternaria sp. Tomato end rot
Amanita sect. Lepidella
A. flavorubescens
A. amerirubescens
A. brunnescens
A. bisporgeria
A. cokeri
A. Sp.
A. dauccipes
Arcryria denudate
Armilleria tabescens
Aureoboltus auriporus
A. innixus
Baorangia bicolor
Boletellus chrysenteroides
Boletus subluridellus
B. subvelutipes
Bondarzewia berkeleyi
Bothia castanella
Botryosphaeria dothidea
Butryi frostia
B. taughannickensis
Camarops petersii
Cantharellus lateritus
C. sp.
Ceratiomyxa sp.
Cerioporus squamosus
C. leptocephalus
Claviceps purpurea
Clavulina sp.
Clavulinopsus aurantiocinnabarina
Climacodon septenrionalis
Clitocybe fellea
Clitopilus prunulus

Cortinarius sp.
Crepidotus applanatus
Cyathus sterocoreus
Daedalus quercina
Daedalopsis confragosa
Daldinia concentrica
Entoloma quadratum
E. strictius
E. sp. (subgenus Leptonia
Erysiphe cichoraccarum (powdery mildew on bee balm)
E. alphitoides
Ganoderma curtsii
Gliophorus lactus
Gymnopus luxurians
Gymnosporangium juniper-virginianae
Haplopilus nidulans
Humidicutis marginata
Hygrocybe cantharellus
H. flavescens
H.miniata
Hypomyces sp.
Lactarius chrysoreus
L. deceptivus
L. impurceptus
L. quietus
L. piperatus
L. lutedius
Lactifluus volemus
Laetiporus sulphureus
Lanmmaoa pallidorosea
L. pseudosensibilis
Lecinnum albellum
L. snelli
Leucoagaricus americana
Leucocoprinus cepaestipes
Leucopaxillus sp.
Lophodermium pinastri
Loweomyces fractipes
Marasmiius rotula
M. siccus
Metarhizium sp.
Mycena haematoous
M. leaina
Neofavolus alveolaris
Niveoporoformes spraguei
Omphalotus illudens
Panellus stipticus
Phaeotremella foliacea
Pholiota suarrosoides
Phylloporus leucomycelinus
Pleurotus pulmonarius
Pluteus cervinus
P. cf petasatus
Ramaria stricta
Retiboletus griseus
Rhytisma americanum
R. punctatum tar spot on maple leaves
Russula compacta
R. mariae
R. parvovirescens
R. variata
2 R. sp.
Scleroderma citrinum
Sparassis spathulata
Stereum complicatum
S. ostrea
Strobilomyces sp.
Thelophora palmate
Trametes betulina
T. versicolor
Tricaptum biforme
Trichoglossum sp.
Tylopilus alboater
T. felleus
Tyromyces galactnus
Xylaria cubensis

This Fungus mutates. That's Good News if You Like Cheese

(Breaking the Mold)

By Emma Goldberg

New York Times Tues Oct 22

Camembert cheese was invented in 1791, when a priest from Brie (yes like the cheese) took shelter with a dairymaid, Marie Harel, as he fled France's anticlerical government. He taught her to make cheese with an edible rind, as local lore tells it. But the lesser known character in Ms. Harel's is a mysterious mold that resided in Normandy.

Pencillium appears in the wild as a toxic blue fungus, but in Camembert, Brie and other French cheeses, it is white and edible. For centuries, cheesemakers didn't know how it evolved from its untamed to its domesticated forms. In a new study, researchers offer the first detailed view of how a fungus transforms into a mold safe for food production in as few as four weeks. Through a summer, the research team planted wild blue Penicillium on the surface of cow's milk cheese curd while simulating the conditions of French cheese caves.

"We saw in real time how the fungi could change their metabolism in a way that would be advantageous for cheese-makers," said Benjamin Wolfe, with Tufts University. He said the research could to "a

diverse new approach to making cheese in the United States."

This Fungus Fires Artillery From the Back of Zombie Flies

By Knvul Sheikh Oct. 31, 2019

The living dead may buzz among us. Attacked by a fungus that takes over their bodies, flies start acting erratically in the moments before they die, playing an unwitting role in spreading the fungus even further. Scientists call them "zombie flies," and they are found across North America and Europe.

On Tuesday, a team of biologists and engineers seeking biological inspiration for fly traps studied the fungus and reported new insights into how the microorganism launches its attack. Their results were published Wednesday in the Journal of the Royal Society Interface.

Sometimes pesky house flies encounter the fungus, called Entomophthora muscae, as they go about their day, sniffing out food and seeking mates. The fungal cells release cuticle-cutting enzymes and slip inside the insect's body. There, the fungus grows into long threadlike structures, digesting the fly's guts and penetrating its brain until the poor insect finally dies.

But E. muscae determines when and where the fly dies so that it is in the best position to release fungal spores onto other unsuspecting flies. By exerting a bit of mind control, the fungus forces the fly to seek an elevated perch and lift its wings in an unnatural position. This allows the fungus to grow from the insect's back and abdomen, taking the form of stripes of white fuzz, even after the fly dies.

The fungal fuzz forms quickly, launching spores as if from microscopic cannons to attack healthy flies that get too close to the dying insect. But the onslaught is fleeting. It is over within a few hours, and it is difficult for scientists to record the launch of individual spores.

"You never know when a specific cannon is going to release a spore," said Jolet de Ruiter, an engineer at the Technical University of Denmark, who helped conduct the research.

To study spore dispersal more closely, Dr. de Ruiter and her collaborators at the University of Copenhagen decided to test E. muscae's launch mechanisms using mini water cannons built in the lab. They reasoned that the water cannons would mimic the way water inside fungal cells helps create enough pressure to eject spores.

The researchers also tested different fluid dynamics, such as air pressure and more viscous glycerol solutions, to see how they might affect the launch of fungal spores. To do this, the scientists connected elastic tubes of various diameters to a syringe filled with fluid and inserted a tiny projectile on top. They slowly increased the pressure on the bottom of the syringe and waited until the top flew off.

When the scientists tracked the projectiles, they found that smaller projectiles had a higher ejection velocity, but that slightly larger projectiles could avoid aerodynamic drag and ended up traveling farther. In other words, fungal spores need to be just the right size — large enough to pass the boundary layer around the fly cadaver, but small enough to be carried farther by air currents, which will allow them to

land on other unsuspecting flies, Dr. de Ruiter said.

Previously, scientists had believed that spores could travel only a few centimeters at most. The most likely way another fly could get infected was when a male was attracted to the scent of a dying female and came close to physically inspect the infected insect.

“If the spores become part of the ambient air, they can end up on all kinds of surfaces where flies might land,” said Ann Hajek, an entomologist at Cornell University in Ithaca, N.Y., who was not involved in the study.

Fungal spores traveling longer distances could affect large numbers of flies, and might be an interesting model for studying epidemics, Dr. Hajek said.

Alternatively, E. muscae spores could also inspire weapons against flies when needed. In fact, the Danish researchers who led the study hope that they can one day build a trap that mimics the way the fungus works in order to catch or kill flies before they transmit disease-causing germs to other animals. .

MAN GOT DRUNK OFF “BEER” BREWED BY HIS OWN BODY AFTER YEAST TOOK OVER HIS GUT

By Kashmira Gander
Newsweek, Oct. 21, 2019

A rare condition caused a man in the U.S. to produce a beer-like substance in his gut after eating carbohydrates, which made him drunk.

The ordeal saw the man pulled over by police for driving under the influence and convinced his family he was hiding a drinking habit, according to a case study published in the journal *BMJ Open Gastroenterology* earlier this year. The research on what is known as “auto-brewery syndrome” is due to be presented at the annual meeting of the American College of Gastroenterology this month, according to *New Scientist.*

It all started around January 2011, when the otherwise healthy 46-year-old was hit with symptoms including dizziness, brain fog, and uncharacteristic aggression.

Doctors couldn’t work out what was wrong, and he was referred to a psychiatrist who prescribed him antidepressants in 2014.

But his symptoms persisted, and one morning he was pulled over by police for drunk driving. The man insisted he hadn’t had any alcohol. But a blood alcohol test told a different story, suggesting he had consumed 20 standard alcoholic drinks, and he was arrested.

His aunt, who had heard of similar cases where people acted inebriated despite claiming not to have consumed alcohol, urged him to have more tests.

Doctors found the fungus *Saccharomyces cerevisiae*, or brewer’s yeast, in the man’s stool sample. The fungus is commonly used in brewing to turn carbohydrates into alcohol, and was kicking off this process in the man’s digestive system, causing his alcohol blood levels to spike without him drinking.

In a test for auto-brewery syndrome, the man was asked to eat a meal heavy in carbohydrates. His blood alcohol levels rose after the meal. Doctors prescribed him with anti-fungal medication, and told

to stop eating carbohydrates.

However, his symptoms of inebriation returned, causing him to hit his head and suffer bleeding in his skull. Large amounts of alcohol were once again found in his system. He insisted he hadn't been drinking, but again doctors didn't believe him.

The man found new hope after he visited the gastroenterology department at Richmond University Medical Center in New York. Physicians confirmed fungal yeast had formed in his upper small bowel and a pouch linking the junction of his small and large intestines. They learned the patient had worked for a construction company and helped to repair houses contaminated with mold, which they believe explained his condition.

The man took a different course of anti-fungal medication, and was ordered by doctors to stop eating carbohydrates for six weeks. Around a year and a half after he first visited Richmond University, he no longer experiences symptoms and can once again eat normally.

The condition was likely triggered by a prolonged course of antibiotics for a thumb injury, which changed the make-up of his gut bacteria, doctors believe.

Dr. Fahad Malik, who treated the man when he was a physician at Richmond University Medical Center, told *New Scientist* the patient "was extremely happy when he started to recover, because for years, no one believed him.

"The police, doctors, nurses and even his family told him he wasn't telling the truth, that he must be a closet drinker," he said.

"Now he is off antidepressants, he's back at work, and he's finally getting on with his life," Malik said.

FIRE-SPAWNED FUNGI HIDE IN OTHER ORGANISMS

Scienceblog.com**.** via *The Spore Print*, L.A. Myco. Soc., Nov. 2019

When a wildfire obliterates a forest, the first life to rise from the ashes is usually a fungus—one of several species that cannot complete its life cycle without fire. How do pyrophilous (fire-loving) fungi survive, sometimes for decades, between fires?

A new study published in *Fungal Ecology* by researchers from the University of Tennessee and the University of Illinois finds that some of these fungi hide out in the tissues of mosses and lichens.

The study was part of a larger ongoing project by a team of University of Tennessee mycology researchers including Karen Hughes, Brandon Matheny, and Ronald Petersen, all faculty members in the Department of Ecology and Evolutionary Biology. They have been studying the changes in the Great Smoky Mountains National Park fungus population since the devastating 2016 wildfire.

"We have this specific group of fungi that we see after a fire; they never occur before a fire," said study co-author Andrew Miller, with the University of Illinois. "You're only going to see the fruiting bodies—what most people recognize as a mushroom—after a fire."

There are several hypotheses to explain where pyrophilous fungi live when they're not reproductively active, Miller said. Some think the spores drift into a newly burned zone from elsewhere, but how those spores could develop in the absence of fire isn't clear. Some suggest the fungus is present in the soil, either as a spore or a storage organ that somehow lasts for decades between fires and isn't consumed by fire.

"The pyrophilous fungi that we found had never been documented for the Smokies before this, in spite of focused collecting by three generations of University of Tennessee mycologists," said Hughes. "Fire has been repressed in the Smokies for 100 years, so where were these fungi hiding? For one pyrophilous species, it seems to exist inside mosses and lichens."

The team collected mosses, lichens, and soil samples from burned and unburned areas in and around the Great Smoky Mountains National Park after the 2016 wildfire.

To determine if the fungi were inside the mosses and lichens rather than riding along on their surfaces, the researchers disinfected the moss and lichen samples before testing their innards to see if any fungi were inside.

The team found DNA from pyrophilous fungi inside the surface-sterilized mosses and lichens from burned and unburned areas. They also found DNA from pyrophilous fungi in the soils inside and outside the burn area. That latter discovery is interesting, Miller said, since pyrophilous fungi do not fruit outside a burn zone. The presence of their DNA there might suggest they're persisting in the soil as fire-resistant spores.

Another possibility is that some of the fungal spores from the burned areas drifted into the unburned zones, leaving a DNA "signature" in the soil, Hughes said. The DNA might persist there longer than the spores could survive in the soil, she said.

"I see the moss or lichen as a protective capsule that gets burned away in a fire and the fungus is not severely harmed," said Daniel Raudabaugh, a postdoctoral scientist with the University of Illinois. "It will burn that outer coating off, and the fungus falls onto the soil and then starts growing."

The researchers say there is more to learn about how the fungi persist in the environment. "There are some things that we still don't understand, such as how pyrophilous fungi live for decades inside mosses and lichens between fire events," Matheny said. "However, evidence suggests that these fungi have taken up residence inside these other organisms on the forest floor, tree trunks, or the tree canopy, which has contributed to their lack of detection by traditional means."

NEW FUNGUS SCARE CLOSES OPERATING ROOMS AT SEATTLE CHILDREN'S HOSPITAL

KOMO News Staff,
Nov. 11, 2019

SEATTLE - *Aspergillus* has again been discovered in air samples at Seattle Children's Hos-pital. *Aspergillus* is a common genus of mold often found in the air—but it can cause complications for surgical patients, especially those with compromised immune systems.

The latest discovery has closed three operating rooms and two procedural areas, forcing the hospital to postpone some surgeries and divert others to other hospitals, said hospital spokesperson Kathryn Mueller. All 14 operating rooms will be closed later in the week as the hospital investigates the cause of the recurrent problem, Mueller said.

"We are deeply sorry for the impact the air quality issues in our operating rooms continue to have on our patients and families," she said. "Seattle Children's remains committed to doing what's right to keep our patients safe."

The latest discovery is the second time that the fungus has been detected in operating rooms at Seattle Children's Hospital. The previous outbreak led to at least five infections and one death, hospital officials said at the time.
It's not yet clear how the state Health Department will respond to the latest findings.

Reprinted from SPORE PRINTS, the Bulletin of the Puget Sound Mycol. Soc.

EDITORIAL MUSINGS

.The article on Ento-mophthora (the insect eater) brought back memories from my grad school days when this fungus was among those studied in a Fungi course I took. The text advised looking for infected flies on old neglected window panes. Sure enough, the search turned up a dead fly with a halo of white conidiospores around it.

The article about yeasts finding a home in a man's stomach was interesting. Too bad it couldn't be manipulated to just ferment enough carbo-hydrates to give him a slight buzz but not drunk, though it sounded like he was happy to be free of the yeast!!

The pyrophilous fungi taking up residence in mosses between fires demonstrated the versiti-lity of fungi at inhabiting all kinds of habitats.

The outbreaks of *Aspergillosis* in a Seattle hospital put me in mind of the rise of antibiotic resistant bacteria due to overuse of antibiotics by health authorities. However, as far as I know, only drastic chemicals like Chlorox or heat will defeat *Aspergillus*. I may be wrong!

Calendar of Events

Check your most recent issue of the *Mushroom Log or* our website for more detailed information. Please plan to join us. All mini-forays are subject to cancellation. Call first to confirm. Please bring a whistle and compass and an **RSVP to the host is mandatory** so they have cancellation flexibility.
Morel and other mini-forays, are subject to change, especially the former. Leaders will be checking the woods to assess their progress, so

you should contact them at least a week prior to the announced mini-foray for any updates.
Miniforays: (RSVP required)

Beside those listed below, other mini-forays are likely during the summer/fall.

See later issues of the Log or the OMS website for later postings of these miniforays..

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Articles for the next Log due Jan. 27, 2019

9 The Mushroom Log

Name:(printed) _____ Address: _____

City: _____ State: _____ Zip: _____ Telephone: _____

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Enclosed please find check or money order (check one):

____$15.00 annual family membership (newsletter via email and website only)
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My interests are: Mushroom Eating/Cookery ____ Photography ____ Nature Study ____ Mushroom ID ____ Cultivation ____ Other (specify) _____

Would you like to be an OMS volunteer? In what way? _____

How did you hear about our group? _____

May OMS provide your name to other mushroom related businesses? Yes ____ No ____

LIABILITY RELEASE AND PROMISE NOT TO SUE:

I understand that participating in the activities of a mushroom club involves a moderate amount of risk. This includes all of the risks of being away from home, risks associated with moving about in fields and woods, risks of encountering inclement weather, risks involved in eating wild mushrooms, risks of losing personal property by theft or misplacement, and all other expected and unexpected risks, including illness or injury. While a member of the Ohio Mushroom Society; or as a non-member attending any event hosted by the Ohio Mushroom Society, I agree to assume total responsibility for my own safety and well-being; and that of any minor children under my care, and for the protection of my and their personal property. I release the Ohio Mushroom Society, its board members, club members, contractors, and any and all entities such as parks or preserves, or any private property owner who may host an Ohio Mushroom Society event, and all other persons assisting in the planning and presentation of any Ohio Mushroom Society event, from liability for any sickness, injury, or loss I or any minor children under my care may suffer during any event or as a result of attending or participating. I further promise not to file a lawsuit or make a claim against any of the persons or entities set forth above, even if they negligently cause me or my minor children injury or loss. I agree to hold the Ohio Mushroom Society harmless from any liability they may incur as a result of any damages to any property I may cause. This release and promise is part of the consideration I give in order to be a member of the Ohio Mushroom Society, or to attend any event which they host or attend, whether a member or a non-member. I understand this affects my legal rights. I intend it to apply not only to me but to anyone who may have the right to make a claim on my behalf.

Signature: _____ **Date:** _____

Return form and check or money order to: Ohio Mushroom Society, c/o Jerry Pepera, 8915 Knotty Pine Lane, Chardon, OH 44024

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