



Ohio Mushroom Society

The Mushroom Log

DARWIN'S FORGOTTEN FUNGUS FOUND AT CAMBRIDGE UNIVERSITY HERBARIUM

By Alex Spencer

<https://www.cambridgeindependent.co.uk/>, Feb. 6, 2019

A priceless specimen collected by Charles Darwin on the *HMS Beagle* voyage has been discovered in the back of a cupboard.

The find was made by the curator of Cambridge University Herbarium, Dr. Lauren Gardiner, who will discuss it and other highlights of the collection during the Cambridge Science Festival, which is supported by the Cambridge Independent.

She spotted the fungus in a dried out pickling jar, which had likely remained untouched since it first came into the university's possession more than 150 years ago.

Gardiner said: "I found this specimen last year, at the back of a cupboard. It was part of the Botanical Museum we used to have in Cambridge and it used to be preserved in alcohol but had completely dried out. The seal was broken, all the alcohol had gone, and it looked revolting.

"But I took it out and looked at it and realized immediately it was a Darwin specimen."

What's more, Gardiner found out that the fungus was part of the original "type" material, which means it is the original physical example of an organism, known to have been used when the spe-

cies was first described and named.

Darwin's fungus—formally named *Cyttaria darwinii*—is an orange golf ball-like fungus that he collected in Tierra del Fuego during his voyage on *HMS Beagle*.

Previously, it was thought that Royal Botanic Gardens, Kew, had the only type material for this specimen. But Gardiner has the original publication by Darwin's friend, the mycologist Miles Berkeley, which describes the *Cyttaria* fungus found on the *HMS Beagle* voyage and backs up Cambridge's claim by mentioning the specimen at Cambridge. "It is a very exciting discovery but all natural history collections have all sorts of things like cupboards—even if you have a huge complement of staff, there so many

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things in the collection you do not have the capacity to curate and there are plenty of exciting discoveries to be made here.

“A lot of our tropical material and our 19th century material was in storage for most of the last 150 years and there is so much material to look at. We quite likely have more Darwin samples in this collection that we haven’t identified yet.”

Gardiner is the only full-time member of staff looking after the herbarium, which has 1.1 million plant specimens in the collection. She hopes eventually to raise funds for more staff to document and research undiscovered gems held by the Herbarium.

One important resource that is yet to be fully researched is the collection that belonged to eminent botanist, John Lindley.

“The Lindley collection is really significant,” she says. “It is much of the historic herbarium of the what is now the Royal Horticultural Society. It was actually in John Lindley’s personal collection and Cambridge University purchased it from his family after he died in 1865. It is laden

with thousands of these important “type” specimens.”

FISHLESS “FISH AND CHIPS” MADE WITH PROTEIN FROM A FUNGUS, *Fusarium venenatum* By James Wood

Dailymail.co.uk./, Jan. 2019 via *The Spore Print*, L.A. Myco. Soc., Feb. 2019

Fish and chips are set to go vegan as Quorn launches an alternative made with protein derived from the fungus *Fusarium venenatum* to help create a similar flaky texture.

The meat-free brand is set to release breaded and battered fishless fillets, both of which took five years to produce.

Both will come in packs of two, with the battered version flavored with salt and vinegar, and the breaded version flavored with lemon and pepper.

Announcing the new product, which is due to launch in March, Geoff Bryant, technical director of Quorn Foods, said the new product should deliver “incredible taste and texture.”

He continued: “It has been five years in the making

and marks the next logical step in helping people reduce our reliance on our seas and oceans for protein. “It will instead meet people’s desire to reduce meat consumption and eat sustainably, with this delicious Quorn Vegan Fishless Fillets range.”

Stored frozen, all products in the fishless range can be oven-cooked in 22 minutes.

MAN ACCUSED OF FATALLY SHOOTING FRIEND WHILE HIGH ON MUSHROOMS

<https://flatheadbeacon.com/>, Feb 4, 2019

BILLINGS - Montana authorities say a 30-year-old Billings man shot and killed a friend and wounded himself with a military-style AR-15 carbine while they were tripping on mushrooms last fall. William Eugene Kenney told a detective that he and 25-year-old John Smathers “got kinda crazy” and thought they were dying after getting high on psilocybin mushrooms on Nov. 21.

Kenney pleaded not guilty on Friday to negligent homicide with a weapons enhancement. An autopsy showed Smathers died of a single gunshot wound to

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the back of the head. Kenney had a gunshot wound to his chin.

He is in jail on a \$50,000 bond.

The previous three articles were reprinted from the March, 2019 Spore Prints of the Puget Sound Mycological Society

Prince of Truffles: Philip Wins Battle To Grow UK's First "Black Diamonds"

By Andrew Young

The Duke of Edinburgh is thought to be the first person in Britain to successfully grow the "black diamonds," which are valued at nearly £1,000 per pound

For Prince Philip, it must have seemed a near-impossible dream. But after years of patience and perseverance, his truffle farm on the Queen's estate at Sandringham is finally bearing fungus.

And not just any old fungus, but rare black truffles so prized by gourmets that they are nicknamed "black diamonds" and are valued at nearly £1,000 per pound.

The Duke of Edinburgh, 97, who inspected his one-acre "truffière" orchard just before Christmas, is thought to be the first person in Britain to

successfully grow the delicacies.

Limited Black truffles so prized by gourmets that they are nicknamed "black diamonds" and are valued at nearly £1,000 per pound

Since 2006, when he bought £5,000 of truffle-impregnated trees, reports have suggested he was engaged in a fruitless exercise.

France is the world's biggest producer of truffles. The fungus grows around roots of beech, oak and hazel trees and favours alkaline soil, which is prevalent at Sandringham in Norfolk. Truffles can be as small as a penny or as large as a golf ball.

Prince Philip, Duke of Edinburgh attends Sunday Service at St. Peter and St. Paul Church in West Newton on February 4, 2018

The Duke drafted in trained dogs and Italian experts in 2010 to find truffles around his trees, but nothing emerged. It was later claimed it would be 2021 before he was likely to achieve a crop.

However, Adrian Cole, a director of *Truffle UK*,

which supplied the trees, revealed that the Duke has defied expectations. "They have been highly successful," he said. "The majority have been the French Périgord black truffle – as good as you can get."

The Duke planted more than 300 £15 saplings impregnated with truffle spores in the Royal Fruit Farm where he cultivates apples, gooseberries and blackcurrants.

The idea was to grow truffles to be used in the Royal kitchens or sold at the farm shop with profits ploughed back into the estate.

Mr. Cole said: 'From what I gather, none have been sold. They have gone to the house or family.'

He added that he believed Sandringham was the first place to successfully harvest black truffles in the UK, but was unable to comment on the size of the crop.

"You will never get that information out of a truffle plantation owner. They are very secretive about it," he said.

December, 2018.
Msn.com.

Scientists Isolate Fungi That Can Boost Plant

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Growth Even With Less Water

By S. Suresh Ramanan

Scientists at the Bharathiar University, engaged in studying the ecology of soil microbes that colonise plant roots, have isolated a fungus that can enhance plant growth even in water deficit conditions.

Numerous types of soil microbes colonise plant roots. Among them, Arbuscular Mycorrhiza (AM) are predominant and they are well-known for mobilising soil nutrients, particularly phosphorous. Of the many soil microorganisms that are found associated with the plant roots, some may be disease-causing pathogens too. Sometimes two groups of soil microorganisms can be found in the same plant roots.

Researchers examined this phenomenon in the roots of tomato plants that hosts both Arbuscular Mycorrhiza and a dark septate endophytic fungus.

Endophytic fungi live inside the plant tissue symbiotically. The researchers have identified this endophytic

fungus as *Nectria haematococca*.

The melanin pigment produced by the fungus gives its characteristic dark colour and hence it is called “Dark Septate Endophytic Fungi.”

The researchers cultured this fungus in the lab and subsequently assessed its role in promoting plant growth in water deficit conditions. They maintained two sets of potted tomato plants, one set treated with fungus inoculum and another set without any treatment. They used field soil as such in the experiment, so as to ensure that native soil microorganisms can still colonize the plants. They induced water deficit condition by restricted watering to the plants.

After eight weeks, the team measured the plant height, stem thickness, leaf area, biomass and proline content. The level of proline content directly corresponds to the abiotic stress tolerance level. The team recorded better growth parameters and higher proline concentration in the potted tomato plants treated with *N. haematococca* culture. Simultaneously, they examined the roots under microscope, which revealed that colonization of dark septate endophytic fungi did

not inhibit native arbuscular mycorrhizal colonization. Scientists believe that secondary metabolite production in plants due to endophytic fungi colonization did promote plant growth.

Speaking on the scope of taking this research output to the field, Dr T Muthukumar says, “We have done preliminary studies on development of user- The research findings have been published in Indian Journal of Microbiology and the team included Piramanagayam, Prema Sundara Valli and Dr. T Muthukumar from the Root and Soil Biology Lab of Bharathiar Univ., Coimbatore. December, 2018. Downtoearth.org _

Endangered Northern Bettongs Aren't Picky Truffle Eaters

The marsupials' varied diet could help safeguard some of Australia's fungi and forests.

By Laurel Hamers

A small endangered marsupial with a taste for truffles may be a linchpin in one kind of Australian forest — and the evidence is in the animal's poop.

Northern bettongs feast on truffles, the meaty, spore-producing parts of certain

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fungi. Plenty of animals eat a selection of these subterranean orbs from time to time. But analyses of the scat from northern bettongs (*Bettongia tropica*) reveal that the

marsupials eat truffles from a wider diversity of fungi species than other critters, including some that no other animals appear to favor, researchers report November 22 in *Molecular Ecology*.

That's an important role because these truffle-producing fungi form

beneficial relationships with tree roots, helping trees pull nutrients and moisture from soil. "There's been a whole raft of published studies showing that those fungi give plants an edge," says Andrew Claridge, an ecologist for the New South Wales National Parks and Wildlife Service in Queanbeyan who wasn't part of the study.

Australia's eucalyptus forests host hundreds, or possibly even thousands, of truffle fungi species, says study coauthor Susan Nuske, an ecologist at the Swedish University of Agricultural Sciences in Umeå. Different species seem to be specialized to associate with particular trees or perform certain roles, so maintaining

that diversity is key. By spreading truffles' spores via scat, bettongs help keep the fungal community diverse and, by extension, the forest healthy, say Nuske and her colleagues.

But bettongs, once so abundant that they were considered garden pests, are now at risk of extinction. The marsupials, which have kangaroo-like hind legs and prehensile tails, live only in a narrow band of habitat where dense rainforest transitions to a more open eucalyptus-dominated forest. That territory has shrunk over time. A World Wildlife Fund-Australia report published December 6 estimates that bettongs' habitat has declined by 70 percent in the past decade. Fewer than 2,500 of the animals are left in the wild, the WWF estimates.

Wiping out bettongs in a particular area would probably lower the diversity of fungi, sending ripple effects through the whole forest, says Nuske.

Nuske and her colleagues set out traps at three sites in North Queensland, and then collected poop samples from captured bettongs and other small mammals. The team analyzed DNA in the scat to figure out what species of

fungi the animals were eating, matching small pieces of DNA to online databases cataloging the fungi's genetic information. The researchers also created a local genetic database by gathering and analyzing fungi from the area.

Bettongs ate a greater diversity of truffle fungi than any of the nine other species that the scientists trapped, which included bandicoots and native rats. Other animals in these ecosystems also eat truffles, but most eat them only seasonally or part time. Fungi (both truffle fungi and other kinds) are the main components of bettongs' diet, and the marsupials appear to be filling an ecological niche that other species aren't, the researchers say.

Still, the relationships between trees, their associated fungi and truffle-eating animals can be challenging to study in the wild. That's because the fungi live underground and the web of associations is complex. It's possible that if bettongs weren't around, other animals would adjust their diets and eat more species of fungi. But it's unlikely that the other creatures could fully compensate for these voracious fungivores, the researchers say. They now

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want to analyze truffle fungus diversity in areas where bettongs once lived but have disappeared to see how those ecosystems have changed over time.

Ecologists and conservationists have been championing the bettong's importance in sustaining these marginal forests for decades, says Claridge, but the outlook hasn't improved for the marsupial. The new work is "a modern take on an old story," he says, using genetic techniques to confirm the bettong's importance in more detail.

The work is part of a larger World Wildlife Fund project looking at the role that bettongs play in their ecosystems to figure out how to best protect them. The report also outlines strategies for using controlled burning to encourage native habitat restoration and keep rainforests from encroaching farther on bettongs' turf.

December, 2018.
Sciencenews.org. _

The previous three articles were reprinted from **Spore Print** — The Journal of the Los

MORCHELLA HORTENSIS?

*"Discovered' and submitted by
Jim Richards Los Angeles*

Mycological Society, Inc.
March/April, 2019

Where did *Morchella hortensis* go?

When I was clearing out some old magazines, I came across this article in *Gourmet Magazine* from April 1954:

"...On to a totally unrelated but pleasant topic — the mushroom: *Morchella hortensis*, Bond, to be specific. *Morchella hortensis*, as we call it familiarly, is a rare mushroom, much prized by Europeans, who rush out in the spring, and conduct an intensive *Morchella hortensis* search. The delicious fungus had always refused to grow in the United States, even in specially prepared mushroom beds, and appeared to be lost to yearning American palates. Only appeared: the mushroom growers might have given up, but the Plant Sciences Department of Syracuse University had not. There, three gentlemen — Dr. Carpenter, Dr. Klens and Dr. Koda — combined forces to outwit Nature at her ancient occupation of mushroom raising. With Dr. Carpenter advising, Dr. Klens imported several varieties of *Morchella*

hortensis and started experimenting with special solutions in which the fungi would flourish. At this point, Dr. Klens left Syracuse for the Quartermaster Corps of the United States Army and Dr. Koda took up the struggle. Dr. Koda determined the right species (or variety) of *Morchella hortensis* for cultivation and, after initial preparation, produced great crops of mushrooms in the space of four days, in a "soil" made of boiled potato extract, a little sugar, and various nutrients.

The new process is as simple as it is fascinating. A tiny bit of mushroom cap is placed in a test tube, in a gelatinous substance. After a few days, tiny specks of mushroom are put in a bottle filled with a liquid, and the bottle affixed to a machine which shakes the solution one hundred ten times a minute for four days. At that time, the process has produced about twenty-five pellets. Then the pellets are chopped extremely fine, and placed in the glass tank in the "soil" aforementioned. Compressed air keeps the liquid "earth" moving, and in four days each of the tiny chopped bits has

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expanded into a mushroom ball. The proportion to the pellets was ten thousand to one, and the maximum yield (once the preparatory phase has passed) is produced in six days! Once this stage has been reached, whenever the good Doctor wants more mushrooms, he merely chops a few mushroom balls up and raises another crop.

The advantages to mushroom-hungry gourmets are numerous and varied. Not only can mushrooms be grown all year round in great quantity (raising mushrooms by present methods is seasonal and takes about seven weeks per crop), but the mushrooms themselves require almost no cleaning, because their “soil” is sterile enough to eat — that is to say, drink.

Naturally, the process is yet to be worked out completely, and *Morchella hortensis*, Bond, is not arriving fresh at grocery shops. Dr. Koda has made soup from this mushroom, though, and his family found it delicious. (At first they were rather reluctant guinea pigs.) *Morchella hortensis* is being transformed into a seasoning even as we

are writing and, in time, local markets may indeed sell mushrooms by the millions, of all types, agreeable month in and happy month out!”

Editorial Musings

I was especially interested in the article featuring *Cyttaria darwinii*. While in Patagonia with a group of Oberlin College alums in the early 2000's I ran across it. The fungus in question is an Ascomycete which forms cankers on southern beech (*Nothofagus*). In spring the cankers (woody blobs) erupt with bright orange gelatinous like small golfballs (and edible=sweet) and much munched-on by the indigenous populace. The ones I saw were already shriveled, so I couldn't sample them.

The two articles on truffles featured Prince Philip's good fortune in successfully raising a crop growing on tree roots inoculated with their mycelium, and at the other end of the spectrum, the buttong's, small marsupials, that subsist on little else.

More in keeping with the season is the article on *Morchella hortensis*. I'm a bit dubious about the

article being from Gourmet Magazine, but will put aside my misgivings as being somewhat snobbish. At least it's about morels which will soon be upon us. The other articles are merely fillers.

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Articles for the next Log due
May 25, 2019

Calendar of Events

Check your most recent issue of the *Mushroom Log* or *this website* for event updates and 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.

OMS "Mini" Forays for 2019

May 4th – 10AM Spring mini-foray – Eastern Ohio – Contact **Sharon Greenberg** at d.greenberg@att.net or (330) 457-2345 to register. **May 5th** (Cinco De Mayo) 11AM, Rising Valley Mini Foray in Richfield – Contact Bryan Lewis at bwaynelewis@gmail.com or (917) 475-6135 to register. **May 11, 12 or June 8, 9** – Morgan Park, Portage Park District. Contact Bryan Lewis at bwaynelewis@gmail.com or (917) 475-6135 for more information.

Friday, June 14 – 8 AM Portage Park District Bioblitz – Towner's Woods Park

The main entrance to the park is located at 2264 Ravenna Rd., Kent, 44240 Franklin Twp., OH. Parking will also be available at 2241 Ravenna Rd., which is the location of our field office and where lunch will be provided at noon. Both locations can only be accessed by coming from the northwest on Ravenna Road due to a bridge closure. Please RSVP the Nat. Areas Steward, Bob Lange: blange@portageparkdistrict.org 330-808-0758 **July 6th**, Saturday @ 1PM at Hellbender Bluff, Lones Rd. near East Liverpool in Lisbon Do not confuse the foray site with the main park. Contact Walt Sturgeon at mycowalt@comcast.net to register.

July 14, 1PM mini foray; central



area near Granville or Hocking Hills. Contact Shirley McClelland at (740) 215-5883 to register. **July 14**, 2 PM; Scenic Vista public hunting area near Lisbon Ohio Mushroom display and walk. Contact Walt Sturgeon at mycowalt@comcast.net to register. **Sunday, July 28**, 11 a.m. – 2 p.m. – Coyote Run Farm, Pickerington Contact Debra Shankland at dks@clevelandmetroparks.com to register. **Oct. 12** (Tentative), Krohn's Conservatory Mushroom Fest, Cincinnati, OH This will be advertised as a major event. Contact Walt Sturgeon at mycowalt@comcast.net for more information. **Sept 7th** at Caesar Creek State Park – Waynesville, OH Contact Crystal Davidson for more information:

crystal davidson@gmail.com OMS

2019 Summer Foray Please join us for our Summer Foray August 17 – 18 at Lake MetroParks, Penitentiary Glen Nature Center

We will feature nationally known mycologists Walt Sturgeon and John Plischke, III. Walt will serve as chief identifier for the foray and John will present our featured talk: A program on Ascomycetes or Edible Fungi & How to Prepare Them.

Both Walt and John are nationally recognized as expert identifiers of fungi, and both have won numerous awards for their fungal photograph **OMS 2019 Fall Foray** We are happy to return to Dawes Arboretum in Newark on the weekend of Oct 5 – 6. More details will be announced as they become available. In the meanwhile, contact Debra Shankland at dks@clevelandmetroparks.com for more information.

Other regional programs

April 26-28, Buckeye Trail Morel Fest (near New Philadelphia) <http://www.buckeyetrail.org/morel-fest.php> There is a \$30 fee. **August 1 – 4**, NEMF in Lockhaven, PA <https://wpamushroomclub.org/events/nemf-foray/> **Sept. 26-29**, 2019, Wildacres Regional Foray, Wildacres Retreat, NC located just off the Blue Ridge Parkway near Little Switzerland, NC **July 19-21**, Davis, West Virginia <https://www.wvmushroomclub.net/single-post/2018/10/11/2019-WV-Mushroom-Foray-News>

Sat. September 21 Miniforay at Bellweather Farm. Time tbd. Pete Richards.

Dick Grimm Memorial

Banquet This popular annual event will occur in early November. Date and location TBD. **NAMA Foray – 2019** Their Foray will be held August 8-11, 2019. the Check (www.namyco.org) for more information or to register.

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Name:(printed) _____ Address: _____

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

Fax: _____ Email Address: _____

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

____ \$15.00 annual family membership (newsletter via email and website only)

____ \$20.00 annual family membership (newsletter via paper, email, and website)

____ \$150.00 life family membership (newsletter via paper, email, and website)

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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DATED MATERIAL

Address service requested. Return postage guaranteed.

Ohio Mushroom Society
The Mushroom Log

Circulation and Membership
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8915 Knotty Pine Lane
Chardon, OH 44024

Editor
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17402 Dorchester Drive
Cleveland, OH 44119

www.ohiomushroom.org

The Mushroom Log, the official newsletter of the Ohio Mushroom Society, is published bi-monthly throughout the year.

Contributions of articles and ideas for columns are always welcome. Articles may be edited for length and content.

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