

MYCOLOGICAL SOCIETY

VANCOUVER ISLAND

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MARCH 2015

A KING IN THE GARDEN **BY TERESA KLEMM**

When my husband, George and I first started our vegetable garden we had visions of garden salads, plates heaped with steaming carrots, beets, and jars of pickled beans. That was then and this is now!

Several years ago we took a mushroom cultivation course presented by the late Bill Chalmers, in Aldergrove. In the few days we spent with Bill, he taught us how to start agar tissue cultures, sterilize hay, and prepare wood chips to inoculate with Oyster and Shiitake spawn. We were discouraged because this process was rather involved, and definitely not something the average person could attempt to duplicate. However, during the course we discussed the *Stropharia rugosoannulata*, a.k.a. King Stropharia, Garden Giant, Wine Cap Stropharia, Burgundy Mushroom and Godzilla Mushroom. This mushroom is easy to cultivate and it doesn't need much attention. Best of all, it would grow amongst our vegetables. It can perennialize in the garden and, with enough hardwood chips to feed on, will return year after year.

Last year we finally got our hands on a *Stropharia rugosoannulata* kit. We needed a large amount of hardwood chips to start our mushroom bed and were fortunate to have a friend with a wood lot. He allowed us to chip some alder from the sides of his logging road. In March, we laid out our bed with cardboard, alder chips and hay, inoculating the alder chips with the spawn. And then we waited.

The mushroom bed is in a full sun position, but with enough moisture it tolerates warm weather. Within a few months we had the 'King' in our garden. The bounty was surprisingly plentiful. Almost every day we had a bowlful for our culinary creations. There were so many mushrooms in the bed we eventually had to give up watering them, since we had other projects to tend to as well.

The *Stropharia rugosoannulata* is a meaty mushroom and can grow up to 5lbs. Given the right conditions, it is a prolific producer. We harvested ours young because the bugs, slugs and heat were competing with us.

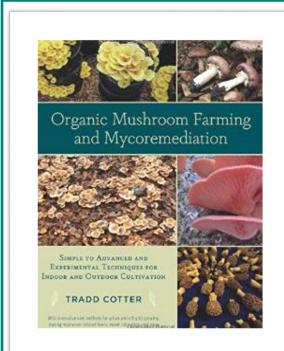
The mushroom has a mushroomy taste to me, although I have heard others say it tastes of asparagus, potatoes and red wine. My tastes are not that refined, but I'll keep those flavours in mind when I sample this year's harvest.

We are starting our own spawn on cardboard this year and it seems to be working. Since we got more wood chips this time, we are expanding the mushroom beds further. This will only be our second year of producing mushrooms in our vegetable garden, but we are already looking forward to our upcoming crop of *Stropharia rugosoannulata*.





Want to start growing your own? Need more information? Look no further than the Greater Victoria Public Library for this 2014 book. Be prepared to put it on hold and wait though, it's popular! If you are in a hurry for this growing season, Amazon.ca lists it at \$31.31. Another book that promises to be interesting is Growing Edible Mushrooms: Practical Techniques for Cultivating 24 Mushroom Varieties by Ja Schindler. It will not be available until November 2015 however.



What would it take to grow mushrooms in space? How can mushroom cultivation help us manage, or at least make use of, invasive species such as kudzu and water hyacinth and thereby reduce dependence on herbicides? Is it possible to develop a low-cost and easy-to-implement mushroom-growing kit that would provide high-quality edible protein and bioremediation in the wake of a natural disaster? How can we advance our understanding of morel cultivation so that growers stand a better chance of success?

For more than twenty years, mycology expert Tradd Cotter has been pondering these questions and conducting trials in search of the answers. In *Organic Mushroom Farming and Mycoremediation*, Cotter not only offers readers an in-depth exploration of best organic mushroom cultivation practices; he shares the results of his groundbreaking research and offers myriad ways to apply your cultivation skills and further incorporate mushrooms into your life—whether your goal is to help your community clean up industrial pollution or simply to settle down at the end of the day with a cold Reishi-infused homebrew ale.

The book first guides readers through an in-depth exploration of indoor

and outdoor cultivation. Covered skills range from integrating wood-chip beds spawned with king stropharia into your garden and building a "trenched raft" of hardwood logs plugged with shiitake spawn to producing oysters indoors on spent coffee grounds in a 4×4 space or on pasteurized sawdust in vertical plastic columns. For those who aspire to the self-sufficiency gained by generating and expanding spawn rather than purchasing it, Cotter offers in-depth coverage of lab techniques, including low-cost alternatives that make use of existing infrastructure and materials.

Cotter also reports his groundbreaking research cultivating morels both indoors and out, "training" mycelium to respond to specific contaminants, and perpetuating spawn on cardboard without the use of electricity. Readers will discover information on making tinctures, powders, and mushroom-infused honey; making an antibacterial mushroom cutting board; and growing mushrooms on your old denim jeans.

Geared toward readers who want to grow mushrooms without the use of pesticides, Cotter takes "organic" one step further by introducing an entirely new way of thinking—one that looks at the potential to grow mushrooms on just about anything, just about anywhere, and by anyone.

"Wow! Tradd Cotter is a genius of organic mushroom production. His step-by-step instructions and beautiful photography make this a must-have book."--Robert Rogers, author of *The Fungal Pharmacy: The Complete Guide to Medicinal Mushrooms* and *Lichens of North America*

Source: Amazon.ca



CC Photo: doblobaut



CC Photo: ken-ichi

daffodil morning looking for something very blue to wear —David Cobb

SVIMS Photographer Alert!

The forest is blooming with fungi all decked out in raindrop beauty, posing to get their picture taken. Now is the time to get photos to enter **for next year's calendar**. Do your best to identify each mushroom, noting the date and what it is growing in or on.



CC Photo: hans s



CC Photo: manu gomi



Rainy Royal Roads Foray with Paul Kroeger

Photo: Mabel Jean Rawlins







UPCOMING EVENTS

Mar. 21, 2015, 6pm

Chinese Mushroom Dinner

Golden City Restaurant \$40 p.p. to Karen Rowe by March 14 Info: SVIMSTreasurer@gmail.com

SVIMS meeting—Apr. 2, 2015

Pacific Forestry Building, 7pm

What role might ectomycorrhizal fungi play in mitigating and adapting forests to climate change?

Marty Kranabetter

SVIMS meeting—May 7, 2015

Pacific Forestry Building, 7pm

Mushroom Movie Night

Come one, come all to the first ever Mushroom Film Fest! You'll learn, you'll laugh, you'll cry, you'll be offended. Watch as fungi consume a leaf ... then an ant .. then a worm ... then a shipload of bad Japanese actors. What happens when Jack Black eats a shroom? What is a podiatrist knee deep in? It's all in the Andy and Kem compilation of Internet mushroom videos. The lucky attendees get to eat popcorn, dance in the aisles, and help the SVIMS players enact a one-act educational extravaganza.

Great Alberta Foray

Jul. 31-Aug. 3, 2015

Grande Prairie, Alberta

Sponsored by the Alberta Mycological Society

www.wildmushrooms.ws

NAMA Blue Ridge Foray

Sept. 24-27, 2015

Black Mountain, North Carolina

namyco.org

MORELS ON VANCOUVER ISLAND

Richard Winder would like to try and determine which species of morels grow on Vancouver Island

When you find a morel, please wrap it separately in wax paper or put it in a brown paper bag so that there are no spores from other fruitbodies. Each fruitbody can be kept in your fridge for a few days while you contact him at rswinder@shaw.ca.

Morels have been popular edible mushrooms for centuries. True morels are in the genus *Morchella* but the species are difficult to tell apart, even for scientists, and new species continue to be described. Even with DNA, several different places in the genetic code have to be used to differentiate species. A number of new

North American species were named in two different 2012 publications, one in French by Clowez, and one in English by Kuo et al. As the latter did not take the former into account, it took two more years to sort names out. The preliminary article became available online in December 2014, by Richard et al. The Table here uses the latest names. Of course other names will no doubt arise in future.

Fortunately, people who eat morels do not need to know the species, just the correct genus. You will have to make a decision about whether to help science and future generations or indulge yourself by adding to your meal. Maybe some of both.









MORELS (MORCHELLA) in the Pacific Northwest					
SPECIES	ENGLISH NAME	HABITAT	STRUCTURE	COLORS	
evimia group (1)	Burn black morel	After fires, typically the following spring	Black morel shape (2)	RIDGES usually pale brown or black-brown \rightarrow dark brown to black, PITS brown when young \rightarrow brown or tan when mature; color may have yellowish, grayish, pinkish, or olive tints	
tomentosa	Black fuzzyfoot	After fires, typically the following spring	Black morel shape; stem and ridges densely tomentose	RIDGES blackish to brownish or grayish \rightarrow grayish to pale tan or whitish, PITS blackish to grayish when young \rightarrow grayish, brown, tan, or whitish	
snyderi	Snyder's morel	Montane conifers , typically in clusters of 2-20	Black morel shape; stem frequently conspicuously fluted and lacunose (with holes in surface), even when young	RIDGES pale yellow-brown → pale tan then gray-brown or blackish, PITS yellow-brown → pale tan to pale gray-brown; colors can vary from yellow-brown to gray-brown, gray, tan, pink-brown, red-brown, or olive-brown	
brunnea (3)	Natural black morel	Hardwoods, typically single	Black morel shape; stem not conspicuously fluted or lacunose when young	RIDGES dark brown to blackish → darker, PITS pale tan to yellow-brown or dull brown	
importuna	Landscape morel	Landscaping and disturbed ground sites	Black morel shape, horizontal cross- ridges creating a laddered appearance	RIDGES pale to dark gray \rightarrow dark gray-brown to nearly black, PITS gray to dark gray when immature \rightarrow gray-brown, yellow-brown or occasionally olive-brown at maturity	
populiphila	Western North American half-free morel	Black cottonwood in river bottoms	Black morel shape except that lower part of the cap (often as much as half of it) free of the stem; mature stem very tall in relation to height of cap	RIDGES yellow-brown to honey brown darkening to brown or blackish, PITS whitish to pale brown \rightarrow brownish to yellow-brown or gray-brown	
tridentina (4)	Blond morel	Mixed forest, various altitudes	Black morel shape	RIDGES whitish to gray-tan or yellowish \rightarrow pale tan and sometimes staining rusty ocher, PITS whitish to grayish to pale yellowish \rightarrow pale tan	
americana	American yellow morel	Black cottonwood in river bottoms; ash, apple, elm	Yellow morel shape (5)	RIDGES whitish to pale yellow-brown, PITS dark when young \rightarrow pale yellow-brown	
prava	Contorted yellow morel (6)	Various	Cap appears like a contorted or somewhat deformed version of <i>Morchella americana</i> with pits irregular in outline and size, and ridges less likely than in <i>M.</i> <i>americana</i> to become eroded and sharper with maturity.	Colors similar to <i>Morchella americana</i> but somewhat darker especially in pits	
rufobrunnea	Blushing morel	Landscaping and disturbed ground sites	Conic to ovoid, ribs vertically oriented at first, pits irregular to vertically elongated; no obvious trough between cap and stem	Grayish to gray-brown → yellowish to brownish, more orange or red-brown in patches especially where injured	

Note: The bold text marks important differentiating features.

Footnotes

- Morchella septimelata, M. carbonaria, and M. anthracophila have been synonymized with M. eximia. Morchella sextelata is only distinguishable by DNA from Morchella eximia. Morchella exuberans (= M. capitata) is indistiguishable except by DNA and subtle microscopic features (conspicuous capitate terminal cells on elements of the sterile ridges).
- Black morel shape is conic, to cylindric with rounded top, sometimes ovoid, occasionally spherical, primary ridges predominantly vertical but vary to more irregular, pits mostly vertically elongated; trough between cap and stem.
- 3. An unnamed species designated Mel-19 is similar but has darker pits and fruits with conifers.
- Morchella frustrata has been synonymized with M. tridentina. Despite its pale colors, this species is genetically a member of the clade that contains the black morels rather than the one that contains the yellow morels.
- Yellow morel shape: ovoid cap generally, may have conic apex, ridges not consicuously vertically oriented, pits rounded-irregular to vertically elongated; no trough between cap and stem
- 6. This English name is not from literature but reflects both the appearance and the meaning of 'prava'.

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Morchella importuna Photo: Michael Beug

Morchella americana Photo: Michael Beug

Is corn smut Canada's new truffle?

Mexicans have long loved huitlacoche, a mushroom-like fungus that randomly infects corn. At Trent University, researchers are trying to cultivate it and hope it becomes Ontario's next niche crop.

By Jennifer Bain

Reprinted with permission

Toronto Star, Feb. 5, 2015





PETERBOROUGH—Sandra Arciniega is in the kitchen of La Hacienda reverently cooking a fungus that infects corn kernels. It's called huitlacoche in Mexico where she was born, and it sounds beautiful when it rolls off her tongue — weet-la-KOH-chay. But Canadians tend to mangle the Spanish word, and then peevishly demand to know what the heck huitla-whatever is anyway.

"I say it's a mushroom or a truffle," says the gracious Arciniega. It's a very unique, exotic item from Mexico."

Let's call huitlacoche a Mexican truffle, or perhaps a corn truffle. Those are much nicer terms than its Canadian nickname, "corn smut".

Huitlacoche, you see, is considered a delicacy in Mexico and fetches a premium price. In North America, the ugly fungus that randomly infects kernels of corns is unfortunately considered a crop destroyer and nothing more.

Here in Peterborough, though, Trent University researchers are in the final phase of a three-year project to see whether huitlacoche could become a niche crop for Ontario farmers.

Led by Associate Professor Barry Saville, chair of the forensic science program, the team is deliberately inoculating sweet corn with this edible fungus, which is really just a form of mushroom.

"Who would eat a pathogen?" asks Saville.

The answer is, most of us, if we enjoy things like blue cheese, yogurt and yeasty bread. So why not corn truffles, especially if we already love mushrooms (a.k.a. gilled fungus)?

At La Hacienda in downtown Peterborough, Arciniega gleefully opens a Mason jar of honey pickled huitlacoche grown by Saville's team and preserved by chefs at Fleming College's Sutherland campus in Peterborough.

She sautés the whitish-grey kernels (truthfully they look like teeth) in oil with garlic, red onions and a

dried Mexican herb called epazote. Corn truffles blacken when heated. Arciniega folds the mixture into homemade tortillas with shredded mozzarella and makes a platter full of quesadillas.

"The amazing part of this is that our ancestors cooked and fed themselves with this," says the homesick chef. "We're going back to the traditional cooking, the way it used to be."

Arciniega came to Canada after university "for a three-month adventure" and never left. Instead she married a "meat and potatoes" Canadian, settled in Peterborough, had two kids (who are now teenagers) and opened "La Hacienda" as her "sanctuary".

Every now and then she will buy a jar or can of Mexican huitlacoche, but it's nowhere near as good as the fresh stuff her grandmother cooked with on special occasions.

Then along came Saville, first as a customer with a fascination for huitlacoche, and then as a professor with an invitation to become a partner in his research project.

Arciniega's task? Taste-test all kinds of huitlacoche, grown from different varieties of Ontario sweet corn and different fungal strains, and harvested at different levels of maturity. Oh, and cook amazing Mexican dishes with it.

"It's a dream that I never thought would ever happen," says Arciniega. "Anything to do with Mexico that brings my culture alive—that's me."

Besides, "there's no limits" to what you can do with Mexican truffles, in her humble opinion. "It's just another kind of mushroom with so many benefits and such a unique flavour."

That flavour, to be honest, isn't nearly as dramatic as you'd hope or fear. Corn fungus is slightly sweet, slightly earthy and obviously mushroomy.

But who doesn't love foods that have a story to tell?

For more of that story, we convene in the "Saville Laboratory" in the DNA Building at Trent University.

It's here that Saville had spent almost eight years researching fungi and fungi-like organisms that cause plant diseases—such as wheat stem rust, wheat leaf rust, common smut of barley and common smut of corn.

The scientist's main focus is "genomic approaches to mitigate fungal threats to crops." In other words, he's trying to stop things like *Ustilago maydis*, "the fungus that gives us huitlacoche," from destroying cash crops.

But several years ago, Saville joined fellow researchers in Mexico, ate huitlacoche for dinner, learned about how Mexicans have prized it since the Aztec empire, and became intrigued by the Canadian culinary possibilities.

"If you can't beat 'em, join 'em kinda thing," he likes to say. This side study now takes up about 10 per cent of his time.

The Ontario Ministry of Agriculture, Food and Rural Affairs kicked in a \$179,000 three-year grant. Saville collected fungal spores (it has been in Ontario for hundreds of years) and is now deliberately infecting corn to create huitlacoche. He's also figuring out whether or not Ontarians will buy this niche crop.

"The huitlacoche project" began in 2012 when Saville's team (six grad students, three undergrads, one technician and project manager Michael Kalisz) grew 400 corn plants on a remote farm. It was a dry year and the yield was just 12 kilos—just enough to celebrate with quesadillas at La Hacienda.

The team grows two compatible strains of the fungus in liquid and then combines them in a plastic "backpack" normally used to vaccinate cattle. Working with Ontario seeds, they grow sweet corn in the field and inoculate the cobs when the "silks" come out in late July or early August. They squirt the fungal liquid down through the silks without puncturing the cobs. Harvest happens about three weeks later when the corn kernels have been replaced by engorged mushroom-like huitlacoche.

For the second year of the project in 2013, Trent University turned over land behind the DNA Building, enough space for 3,300 corn plants and a 32-kilo harvest.

The fall feast that year was at Fulford's Restaurant at Fleming College, a new culinary partner. There was cornbread with chili-citrus butter, risotto, ravioli, veal loin with succotash and even strudel, all of it flavoured with huitlacoche.

The Fleming team, led by chef/professors Steve Benns, Mike Sterpin and Stever Moghii, began pickling huitlacoche so it could be used year-round.

In 2014, Saville's team cut the number of corn plants down to 2,600, but worked on week control and enjoyed a record 290-kilo harvest.

There was enough to sell some fresh at the Peterborough farmers' market. Their third annual feast included huitlacoche tamales, smoked corn soup with pickled huitlacoche, sous vide huitlacoche-crusted beef tenderloin and raspberry mousse cake with huitlacoche brittle.

"It's really interesting, and humbling actually, to watch a chef," says Saville. "It's important to emphasize that I really pay attention to what the chefs are doing. It's a joint effort to see where this market will go."

Now, with a little grant money remaining, Saville has asked the government for one more growing season before submitting his final report.

He hopes to create a side business, perhaps making something like a proprietary "corn truffle plug" that farmers can buy to inoculate corn (plus protocols to keep the fungus from spreading).

For that to happen, he needs to convince people to eat huitlacoche.

After a tour of Saville's lab and quesadillas at La Hacienda, it's time for a huitlacoche feast at Fleming College.

Benns—who still cheerfully mangles the word huitlacoche—grew up on a hog farm. When the corn crop grew "smut," his dad would make him knock it off and feed it to the animals.

Now Benns is having a ball creating fancy dishes with this very same fungus, playing up its "truffle" side.

Talk turns, as it invariably does with this ugly delicacy, to whether it's best to keep the Mexican name huitlacoche or give it something less intimidating.

Huitlacoche grows on you once you get the hang of it. Corn truffle makes it desirable, yet approachable.

"I really like corn smut," declares Benns, "because it's kind of risqué."





Huitlacoche quesadillas

La Hacienda Corn Truffle Quesadillas

Sandra Arciniega, owner of La Hacienda restaurant in Peterborough, made these quesadillas for me using Trent University's huitlacoche pickled by Fleming College. Buy small jars of Mexican huitlacoche (sometimes labelled cuitlacoche/corn truffle) and epazote at Latin American grocery stores in Kensington Market and elsewhere.

Arciniega made her tortillas from scratch, using Maseca (instant corn masa flour) and a tortilla press. I tried that, too. If you have the press, it's quick, easy and rewarding. Just follow the directions on the package.

1 tbsp canola oil

1 tbsp minced garlic

1/2 cup finely diced red onion

8 oz. jar huitlacoche (corn truffle)

1 tbsp dried epazote (a Mexican green herb), crumbled

Large pinch each: salt, pepper, pure chili powder (such as chipotle, ancho and guajillo), or to taste

1 tbsp chopped cilantro

8 small corn tortillas (about 6 inches)

1/2 cup grated mozzarella

Purchased green or red Mexican salsa, (optional) for serving









In a small non-stick skillet, heat oil over medium-high. Add garlic and onion. Cook, stirring, 4 minutes to soften. Stir in huitlacoche, epazote, salt, pepper and chili. Reduce heat to low; cover. Cook, stirring often, 10 minutes. Stir in cilantro.

To serve, warm tortillas, in batches, in large, dry skillet over medium-high heat, 1 minute. Flip; top each with about 1 tbsp huitlacoche mixture. Sprinkle each with 1 tbsp cheese. Cook 1 minute. Using spatula, carefully fold in half to form half moons.

Serve hot. Pass salsa separately, if desired.

Makes 8.

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THE LAST WORD

Morel Values E. Peter Brunette, @thegreatmorel.com

I'll share with you a secret, If you promise not to tell. About a tasty mushroom, It's known as the Morel.

Some people plan all winter, It's why they wait for spring. To go afield out searching, For that delightful little thing.

When lilacs have turned purple, And about to go to bloom, It's time to be out looking for your favorite mushroom.

You'll be putting up with wood ticks, And nettle weed that stings. But I guess it's all quite worth it, For all the joy it brings. When you bring this your treasure, That a hat would barely fill, But will make one meal so special, For this an annual thrill.

Some fry them up in butter, Or put them in a stew. You can dice them up for meatloaf, I guess it's up to you.

So if you find yourself a spot, Where the tasty mushrooms sprout, You dare not breathe a word of it, That's what it's all about.

Cause if you share it with a friend, Though sworn to secrecy, Next year you'll go back to your spot, And there your friend will be!