



# The Nova Sclerotium

Fall 2021

sclero·ti·um : the hard dark resting body of certain fungi

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## President's Message

Gavin Kernaghan

Welcome again to the fourth issue of Nova Sclerotium, the newsletter of the Nova Scotia Mycological Society. Things look like they're slowly getting back to some form of normal and this fall's activities reflected the improvement in our provincial COVID situation. We finally were able to put boots to the ground in October, but we could unfortunately only have a limited number of people in the group. Let's hope the health situation keeps improving and will allow us to have everyone who wants to attend.

## Editor's Note

Tom Clair

In this issue, we have articles on both the field and virtual forays, as well as an article from Keith Egger continuing his discussion on fungal taxonomy. As we know, we need to know what we're doing when picking mushrooms for our consumption. It's also much more interesting when look at mushrooms to figure out how they fit in within ecosystems and how they interact with the plants that surround them.

## 2021 Nova Scotia Mycological Society Fall Mushroom Field Foray

Tom Clair

Finally, Provincial authorities decided that groups of up to 50 people could participate in outdoor activities as long as they had proof of full vaccination. That was the signal that it was now safe to have an outdoor fungal foray. Our Society President, Gavin

Kernaghan used his connections and was able to secure the use of the Uniacke Estate Museum (<https://uniacke.novascotia.ca/>) near Lower Sackville for October 17. The estate is located in a lovely mixed forest with a number of paths winding

through wooded areas. The day turned out to be mild and cloudy, just perfect for the field trip.



**Figure 1.** People gathering at the Uniacke Estate Museum for the NS Mycological Society field foray

The full complement of fungophiles checked in and had their vaccination status checked in the Carriage House which had been made available by the Museum. People were divided into two groups the first led by Gavin and Scott Cunningham, the other by Keith Egger and John Crabtree.

Mushrooms and other fungi abounded in the local forest and after an hour and a half, people regrouped at the

Carriage House, ate their lunches and socialized. The experts then visited the tables where samples were laid out and discussed the finds with collectors. In that short period of collecting, seventy two species in five orders were

found and id'ed usually to the species level (and are listed at the end of the newsletter).

Though the number of pickers was reduced from previous years due to COVID-19 restrictions, in the short time spent in the woods, this part of the world revealed the richness of the fungi community in its forests.

Also, though not sponsored by the Mycological Society as outreach, two of our members of the Executive, Keith Egger and Allison Walker also led forest walks for the Blomidon Naturalists and the Arlington Forest Society, both in the Annapolis Valley.



**Figure 2.** Mushroom samples found near the Uniacke Estate Museum laid out on a table

## 2021 Nova Scotia Mycological Society Virtual Fungal Foray

Tom Clair

Due to COVID restrictions on group sizes, it was impossible to conduct the usual field foray in 2020, so last year, the executive decided to try to hold a virtual, online foray. The idea was that people would show their samples through their computer cameras and the local experts would try to identify them and make comments on their ecology or other interesting facts. The results of this experiment were described in the Fall 2020 newsletter and showed that the idea generated good interest and were instructive to participants. However, it was shown that displaying of samples by individuals to their computer cameras left a lot to be desired because of lighting and other issues. A number of recommendations were made, the main one being that it would work better if members submitted pictures

containing main identification features and a description of the habitat where the fungi were found.

Advertised in the newsletter, the Virtual foray was held on Saturday November 6 and was a great success. The Society Secretary, Adèle Bunbury-Blanchette set up and coordinated the session and experts Gavin Kernaghan, Keith Egger and Logan Grey viewed the photos. Pictures were sent in from members from Cape Breton, all the way to LaHave showing that members from all over the Province were able to participate.

In all, pictures of 28 fungi were sent in by the membership and another 28 were added by the expert panel. The new format worked very well, as contributors generally took several pics of their specimens ensuring the major characteristics were shown. As shown by the examples sent in, the samples sent in gave the reviewers good, clear pictures which were more easily identified. Moreover, the experts reviewed the pictures beforehand and were better prepared to make identifications, even though there were still differences of opinion on some samples.

All in all, the virtual foray was a success for the participants. It's quite likely that this exercise might become an annual feature for the Society.



Figure 3. Mushroom photos submitted for the Virtual Fungal Foray

# Identifying Mushrooms: Common Misconceptions and How to Avoid Them

Keith Egger

Mushroom experts are commonly confronted by the question “What is it?”, often followed immediately by “Can I eat it?” Many mycologists

often jokingly respond “All mushrooms are edible, some only once”. Whether you live to eat it again depends upon the accuracy of your

identification, so how does one get to that potentially life-transforming ID? I find that novice mushroom hunters often have misconceptions that get in the way of accurate identification. I'll run through a few of these.



Figure 4. Coral fungus (*Clavulina coralloides*)

### Misconception #1: There aren't many different kinds of mushrooms

When you see simple field guides or posters of edible and/or poisonous mushrooms you might think there are only a few dozen of each type, but there are actually thousands of different kinds of mushrooms. Mushrooms are members of the Kingdom Fungi which is possibly the second most diverse group of organisms on the planet – it's estimated that there are 2.2 – 3.8 million species of fungi (including molds, yeasts and mushrooms) only a small fraction of which have been described and named. Mushrooms are fungi that form visible fruiting bodies and there are probably 150,000 or so species worldwide, of which only about 30,000 have been named and described. That's far more than the few dozen you see represented in edible and poisonous brochures and posters!

### Misconception #2: Field guides include all the mushrooms in a region

I've seen statements made in print and on YouTube videos to the effect that a good field guide will include all the mushrooms that you might find in a region. The truth is far from that. Even the best field guides only cover the most common mushrooms, generally somewhere between 25% and 40% of the mushrooms that occur in the region covered. And, since only about a third of mushroom species have been named and described by mycologists that number is actually more like 10 – 15% of the total number of mushrooms (described and undescribed) that might be present. On the positive side, it is still quite possible to pick up an undescribed mushroom on your forays in the woods – that would be exceedingly unlikely for other organisms such as birds or mammals!

### Misconception #3: All mushrooms can be identified from a picture

Some mushrooms have distinct enough characters to be identified from a picture, at least to group if not to species (examples: hedgehogs, chanterelles, shaggy mane, chicken-of-the-woods). However, some mushrooms are difficult or impossible to identify from a picture alone (examples: *Russula*, *Lactarius* and *Cortinarius* species).

For a positive ID to species these mushrooms may require observation of associated host trees, non-visual or transient characters, microscopic examination and some may even require a DNA barcode sequence for an accurate ID.



Figure 5. *Cortinarius* showing cortina

If you are able to identify surrounding trees (or lack thereof such as growing on a grassy area) then record that information; if you're not proficient at plant identification, even whether you were in a hardwood/deciduous versus a softwood/coniferous forest can be helpful. As for transient characters, a mushroom's odour can be important (assuming the smell isn't "fungoid" but something unique like bleach or coconut). Some guides suggest you taste and spit out a small portion (I don't condone this and suggest that odour alone be sampled). Some mushrooms (the milky caps) exude a latex when cut and the consistency and colour, as well as colour changes over a minute or two, can be crucial for identification. Other colour changes, sometimes called bruising, can be important as well. Many mushrooms change colour when they are damaged or handled and that colour change can be important for identification. Finally, the substrate the mushroom is growing on, such as rotting wood or leaf litter, is valuable information.

All of the above could be key to successful identification and may or may not be evident from

a picture. To maximize the possibility of an accurate ID always have images of both the upper and underside of the mushroom, or if you have multiple mushroom fruiting bodies flip one over so that your shot includes the upper and underside. It can also help to have several growth stages from young to old fruit bodies if present; some characteristics (e.g. the web-like veil in *Cortinarius* mushrooms) are best seen on young specimens. Combining a good picture or pictures with some notes on transient or non-visible characters will greatly increase the chances of an accurate ID.



Figure 6. *Amanita frostiana*

#### Misconception #4: Mushrooms are either edible or poisonous

Paracelsus is credited with the adage 'dosis sola facit venenum' - only the dose makes the poison. It's meant to communicate that only when a substance accumulates to a sufficient concentration in the body can it have a toxic effect. Some mushrooms contain toxins and can cause poisoning that ranges from gastrointestinal upset to fatalities. However, the same amount of a poisonous mushroom may not have an effect on an adult yet be harmful to a child. Furthermore, many cases of 'poisoning' by a

mushroom turn out to be food poisoning from harmful bacteria growing on or in the mushroom. Sometimes the exuberance of finding an edible mushroom overrides basic food quality concerns, resulting in some poor-quality produce being consumed (which would probably never be even purchased let alone eaten if encountered on a supermarket shelf). Mushrooms harbouring food poisoning bacteria can get branded as poisonous even when they contain no toxic compounds. Finally, people can have individual sensitivities to any kind of food, including mushrooms; what is consumed with delight by some may make others ill. It is always recommended to eat a small portion of a mushroom the first time you try it to determine if you react poorly.

#### **Misconception #5: The most confident people are the most knowledgeable**

I see time and time again on social media where someone will post a photo of a mushroom and say "Is this such and such" and there will be numerous positive replies before someone more knowledgeable says "Actually it is not such and such, it is the similar looking mushroom...". One would think that people would not jump in with an ID if they are not sure, and that is probably true except what's operating here are two biases described by psychologists as the Dunning-Kruger effect and the Over-confidence Effect.

The Dunning-Kruger Effect can be paraphrased as "the less knowledge you have the more confident you are". There is a large literature in psychology documenting that people believe they know more than they actually do, in fact the less knowledge a person has the

more likely that person is to overestimate their capabilities. It's not that people with less knowledge are more malicious, it's that the more shallow your understanding the more likely you are to include many different but similar mushrooms in your concept of a species. Whereas an expert who knows more about the subtle differences between species would recognize differences. Another type of cognitive bias is the Over-confidence Effect. Psychologists have demonstrated that people are overly confident in their own answers; in some studies people who rated their answers as "99% certain" turned out to be wrong 40% of the time! Combine the often-insufficient photos and lack of documentation of non-visual characters with the Dunning-Kruger effect and the Over-confidence Effect and it is not hard to imagine people confidently eating mushrooms that they should be treating more warily. The internet is fraught with potential for wrong identifications due to the difficulty in ascertaining diagnostic characters from a photo, often unknown credentials of the person giving the ID, and the Dunning-Kruger and Over-confidence effects.



Figure 6. Young sporocarp

## Misconception #6: Artificial Intelligence-based apps eliminate the need for human identification

Again, I often see posts on social media postings saying “My AI-based app called this mushroom such and such. Is it correct?” These can be AI-based phone apps, or sites like iNaturalist which has an AI-based identification aid, called Computer Vision, that suggest IDs for photos you post. These aids can be quite good if you have provided a photo where important diagnostic characters are visible at a scale that allows them to be assessed and where the AI has been trained on examples of your mushroom (the number of different species used for training is information often not provided by the app developers). However, just because a name is at the top of the list of potential identifications, that doesn’t mean it’s correct. Too often people just take the first name that AI suggests and think that they have a positive ID. I can assure you, iNaturalist Computer Vision is pretty good but frequently gets the identification wrong, especially where diagnostic characters are not visible or obscured in the photo or where ID to species depends upon non-visual characters.

### A cautionary tale

You may not recognize the writer Nicholas Evans, but you may remember his novel that was made into a movie: *The Horse Whisperer* starring Robert Redford. Mr. Evans was visiting his brother-in-law’s estate in Scotland in 2008. When he arrived one of the workers on the estate said “the

woods are full of ceps” referring to *Boletus edulis*, called Ceps or Porcini in Europe and King Bolete in North America. On the basis of that information Mr. Evans went into the woods and found a patch of mushrooms that he thought were Ceps. He brought them home and cooked them up for dinner. Four family members ate them but shortly afterwards developed symptoms of poisoning. When Mr. Evans consulted his mushrooms field guide he discovered to his horror that instead of the highly-prized Ceps mushroom, he had picked the Deadly Webcap (*Cortinarius speciosissimus*). Viewed from the top (the perspective of most photos that you see posted for identification on social media groups) *C. speciosissimus* has similar shape and colouration to *Boletus edulis* but the Deadly Webcap has gills on the underside of the cap while Ceps has pores – an important diagnostic character that if noticed would have immediately pointed to an incorrect ID. To make a long story short, Nicholas and his family members suffered kidney failure and endured years of dialysis waiting for kidney transplants.

Mr. Evans made four errors that led to this poisoning: he trusted the advice of someone with unknown expertise (the estate worker), he did not observe the underside of the mushroom, he did not check his mushroom field guide before eating, and his family did not try a small portion when eating the mushroom for the first time. There is also a dose caution to this story: the treating physician said that had any of the children eaten the mushrooms they almost certainly would have died.

Although *Cortinarius speciosissimus* hasn't yet been recorded in Nova Scotia, there are records from the eastern US and we do have related *Cortinarius* species that contain the toxin, orellanine, that causes irreversible kidney failure.

In times past, learning to identify mushrooms required first, purchasing a good field guide(s) (see <https://www.nsmycologicalsociety.org/recommended-books>) and, if possible, linking up to a knowledgeable person or persons, often through a local mycological or naturalist club. Then the hard work of learning characters and mycological terminology began. Starting

with just a few recognizable types, one would progress to recognizing more and more, potentially reaching expert status after years of study and learning. That is still a well-advised strategy. New tools such as social media groups and AI are an aid to identification, but ultimately you need to be confident that the ID is correct; never eat a mushroom unless you are 100% certain what it is. Foraging for mushrooms can be rewarding but you need to put in the hard work to develop expertise. There are no shortcuts when the consequences of making a mistake can be dire. It's up to you to take precautions that reduce the risk.

Classification	Scientific Name	Common Name (Naturalist)
Phylum: Basidiomycota		
Subphylum: Agaricomycotina		
Class: Dacrymycetes	<i>Dacrymyces chrysospermus</i>	Orange Jelly Spot
Class: Tremellomycetes	<i>Pseudohydnum gelatinosum</i>	Toothed Jelly Fungus
Class: Agaricomycetes		
Order: Agaricales		
	<i>Amanita citrina</i>	False Death-Cap
	<i>Amanita porphyria</i>	Grey-veiled Amanita
	<i>Amanita vaginata</i>	Grisette
	<i>Armillaria ostoyae</i>	Honey Mushroom
	<i>Catathelasma ventricosum</i>	Cat
	<i>Connopus acervatus</i>	Cluster Cap
	<i>Cortinarius armillatus</i>	Red-banded Webcap
	<i>Cortinarius camphoratus</i>	Goatcheese Webcap
	<i>Cortinarius semisanguineus</i>	Surprise Webcap
	<i>Cortinarius</i> sp.	Webcaps
	<i>Cystoderma amianthinum</i>	Earthy Powdercap
	<i>Entoloma abortivum</i>	Aborted Entoloma
	<i>Hebeloma</i> sp.	Poisonpie
	<i>Hygrocybe flavescens</i>	Golden Waxcap
	<i>Hygrocybe miniata</i>	Vermilion Waxcap
	<i>Hygrophorus erubescens</i>	Blotched Woodwax
	<i>Hygrophorus hypothejus</i>	Herald of Winter
	<i>Hygrophorus russula</i>	Pinkmottle Woodwax
	<i>Hypoloma capnoides</i>	Smoky-gilled Hypoloma
	<i>Inocybe</i> sp.	Fiber Caps
	<i>Laccaria laccata</i>	Deceiver
	<i>Lepista nuda</i>	Blewit
	<i>Gymnopus androsaceus</i>	Horsehair fungus
	<i>Mycena haematopus</i>	Bleeding Fairy Helmet
	<i>Mycena</i> sp.	Bonnets
	<i>Pholiota malicola</i>	Scalycaps
	<i>Pleurocybella porrigens</i>	Angel's Wings
	<i>Pleurotus ostreatus</i>	Oyster Mushroom
	<i>Sarcomyxa serotina</i>	Late Oyster
	<i>Tricholoma caligatum</i>	False Matsutake
	<i>Tricholoma subsejunctum</i>	Knights
	<i>Tricholoma virgatum</i>	Knights
	<i>Tricholomopsis decora</i>	Decorated Mop

Table 1. Mushroom identified during the foray at Uniacke Estate Museum. Continued on Page 9



Order: Boletales	<i>Boletus frostii</i>	Frost's Bolete
	<i>Gomphidius glutinosus</i>	Slimy Spike
	<i>Hygrophoropsis aurantiaca</i>	False Chanterelle
	<i>Leccinum scabrum</i>	Brown Birch-Bolete
	<i>Leccinum versipelle</i>	Orange Birch-Bolete
	<i>Paxillus involutus</i> complex	Brown Roll-Rim
	<i>Scleroderma aurantium</i>	Earthballs
	<i>Suillus spraguei</i>	Painted Suillus
	<i>Suillus weaverae</i>	Butterball
	<i>Tapinella atrotomentosa</i>	Velvet-footed Pax
Order: Cantharellales	<i>Clavulina amethystinoides</i>	Amethyst Coral Fungus
	<i>Clavulina coralloides</i>	White Coral Fungus
	<i>Clavulina cinearia</i>	Grey Coral Fungus
	<i>Craterellus tubaeformis</i>	Yellowfoot
	<i>Hydnum repandum</i> complex	Wood Hedgehog
	<i>Ramaria subbotrytis</i>	Coral Fungi
	<i>Turbinellus floccosus</i>	Scaly Chanterelle
Order: Polyporales	<i>Gloeophyllum sepiarium</i>	Conifer Mazegill
	<i>Fomes fomentarius</i>	Hoof Fungus
	<i>Fomitopsis pinicola</i>	Red-banded Polypore
	<i>Phaeolus schweinitzii</i>	Dyer's Polypore
	<i>Trametes versicolor</i>	Turkey Tail
	<i>Trichaptum abietinum</i>	Purplepore Bracket
	<i>Tyromyces chioneus</i>	White Cheese Polypore
Order: Russulales	<i>Albatrellus ovinus</i>	Sheep Polypore
	<i>Lactarius gerardii</i>	Milkcaps
	<i>Lactarius hibbardae</i>	Milkcaps
	<i>Lactarius lignyotus</i> complex	Chocolate Milky
	<i>Lactarius vinaceorufescens</i>	Yellow-latex Milkcap
	<i>Lactifluus deceptivus</i>	Deceptive Milky
	<i>Neoalbatrellus caeruleoporus</i>	Blue-pored Polypore
	<i>Russula silvicola</i> complex	Emetic Russula
	<i>Russula laurocerasi</i>	Almond-scented Russula
	<i>Russula nigricans</i> complex	Blackening Brittlegill
Order: Thelephorales	<i>Phellodon niger</i>	Black Tooth
Phylum: Ascomycota	<i>Neolecta irregularis</i>	Irregular Earth Tongue
	<i>Xylaria polymorpha</i>	Dead Man's Fingers

Table 1 (cont.). Mushroom identified during the foray at Uniacke Estate Museum.



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