

Trav:

Welcome! Today I'm interviewing Alan Rockefeller. Alan is a mycologist based out of Oakland, California who has been studying mushrooms since 2001. Alan travels around the world studying and classifying mushrooms. Alan teaches fungal analysis techniques such as microscopy and DNA barcoding at Counter Culture Labs, an open science community laboratory in Oakland. Alan analyzes his regional mushroom collections using PCR and Sanger sequencing, and always uploads all of his DNA sequences to Genbank.

For my first question, I believe you said something about using your photos for Wikipedia?

Alan:

Yes, I like to go through my good photos and see if it is better than the one on Wikipedia. If mine is better, I'll put mine up there. This way it's always available to the public under a free license.

Trav:

So, anyone can do that?

Alan:

Yes, anybody can and should add photos to Wikipedia.

Trav:

That's awesome.

I am really interested in learning more about *Inocybe*. It's my understanding that some of them can have psilocybin in them?

Alan:

Yes. *Inocybe* are some of the most boring mushrooms to look at because they are all small and brown, but are among the most beautiful species to look at under the microscope.

Trav:

I thought that was interesting. Also, if it has psilocybe or psilocybin in it, it can make it safe to eat or dry, obviously first and then some people will use it for an altered state or for hallucination?

Alan:

Yes, there are about 200 species of mushrooms that have psilocybin. *Inocybe* was recently split into several different genera - all of the toxic and hallucinogenic species ended up in *Inocybe sensu stricto*. Interestingly, none of the ones that contain psilocybin also contain toxins, even though both psilocybin and muscarine are found in many clades of *Inocybe* s.s.

Trav:

Yeah, that's kind of what I got with Wikipedia. They said, "Seven species have hallucinogenic properties."

Alan:

Maybe it's nine now because I tested *Inocybe insignis* from Ohio and it was pretty high in in tryptamine alkaloids. There is also a new species from the west coast that will be named *Inocybe bohémica* which will probably test positive for psilocybin.

Trav:

Oh, yeah, that's interesting.

Alan:

The seven hallucinogenic *Inocybe* that Wikipedia knows about are all European.

Trav:

Oh, they're all European, so you can't find them here in the U.S.? Just the ones that you've discovered are here?

Alan:

I didn't discover them, but people sent me samples. I did some microscopy and DNA barcoding to verify the species and tested the psilocybin level.

Trav:

Oh, that's awesome. I did an interview with Tina Wismer, Senior director for Animal Poison Control Center out of New York City. She said that *Inocybe* can be one of the most dangerous species of mushrooms to consume. She was poison control for specifically for pets.

Alan:

I think they poison a lot more pets than they poison people. *Inocybes* are not brightly colored - they are little brown mushrooms, so not many people eat them. They can contain muscarine which can be pretty toxic and is deadly in high amounts. Almost nobody ever eats *inocybe* and if they do, they don't really eat enough to get poisoned. A lot of them smell kind of weird or unpleasant so a lot of dogs will go for them.

Trav:

Yeah, that's what the studies show. I understand also that with *Galerina*, which can be a very poisonous mushroom, it can also contain psilocybe too?

Alan:

Yes, *Galerina* is a pretty large genus and most of them are little mycenoid species which grow in moss, and they're not poisonous. There's a couple of species of *Galerina* that are much larger and grow on rotting wood - those are the poisonous ones. The one *Galleria* with psilocybin is known only from Germany.

Trav:

That's awesome. I also saw in one of your last videos that a species of *Tubaria* was found that had psilocybin in it, which is not common, or not studied yet?

Alan:

Yeah. That was definitely a surprise because nothing in *Tubaria* is known to contain psilocybin. It is both uncommon and unstudied.

Trav:

Yeah. And that grew on wood chips too?

Alan:

It was just growing on disturbed ground. That one came from Pennsylvania - someone found them growing around his house. He noticed they were staining blue, so he sent me some. I tested the psilocybin levels, sequenced the DNA and did microscopy, which confirmed Tubaria.

Trav:

And you tested the potency with that testing stuff you have from the video?

Alan:

Yes, the Miraculix test kit.

Trav:

How much psilocybin did Tubaria have in it?

Alan:

It came in at around 1%. An average amount, not strong or weak. About the same as *Psilocybe cubensis*.

Trav:

Nice. How many species have you named? I know that in your last video, you said that naming something after yourself is not allowed.

Alan:

Yeah, the nomenclature rules say you can't name any organisms after yourself, which is a good thing. Otherwise, people might go around just naming everything after themselves. You can name it after someone else, but that's not really a good idea, because in 10,000 years people will wonder, "Who was Tom?" So, it's usually best to name something after a unique feature that helps separate it from its closest relatives. I don't know exactly how many I have named, maybe six or eight or something like that.

Trav:

And you published everything, so everyone can find that and read about it?

Alan:

Yeah, they've been published in various scientific journals. There are a ton of undescribed species out there. So, when I notice something is undescribed, I will sequence it and add the DNA sequences to GenBank. That way the information is public and people can use it for their own analysis when they are ready to name it.

Trav:

So why did people back in the day use their own names? Or maybe their husband's name or wife's name to name a species of mushrooms? Do you think that will change with time? Or do you think those mushrooms will be called that forever?

Alan:

Those mushrooms will be called that forever, because the first validly published name gets priority. I think it tends to have to do with the ego or doing a favor for somebody and naming a mushroom after them. It's fallen out of favor recently, which is good. There are a lot of mushrooms that are named after people who are not particularly notable, the name doesn't really have any meaning. These

names are harder to remember and are less useful compared to mushrooms that are named after a unique characteristic that separates a species from its closest relatives.

Trav:

Right. So small sections of a word in Latin could mean the color, the stature, the size, what compounds are in it. Which then helps describe that mushroom and that's how that name has come about, pretty much?

Alan:

Yeah, exactly.

Trav:

Pluteus americanus, that's another that's a *pluteus* species that has psilocybin in it. Are there any others that people should be aware of and that genus?

Alan:

There's a lot of fascinating *Pluteus* species. We used to call most hallucinogenic *Pluteus* species *Pluteus salicinus*, but it turns out that is a European species. So in Europe, you have *Pluteus salicinus* and then a smaller one, *Pluteus cyanopus*. Here in North America *pluteus americanus* is the most common one, it's medium sized to large and is grey, with a blue stem base. We also have some smaller and more rare psilocybin containing *Pluteus* such as *P. saupei*. There's a couple more poorly known blue staining *Pluteus* described from Florida and Texas. Not much is known about them, but there's a few photos of them on citizen science websites like <http://MushroomObserver.org> and <http://iNaturalist.org>.

Trav:

In your opinion, which psychoactive mushrooms do we have in Maine? There's a lot of controversy on whether there is large or a small amount. There's a lot of confusion regarding Maine's psychoactive fungi.

Alan:

I keep a list updated of all of the psilocybin mushrooms, separated by state and by country. For Maine I have eight species. <https://www.shroomery.org/8461/Which-psilocybin-mushrooms-grow-wild-in-my-area>. All eight species found in Maine have a link to a Mushroom Observer record. If you are wondering what they look like, or if they are accurately identified you can click the link for photos and details. I see one *pluteus* from Maine that's definitely bruising blue at the stem base indicating the presence of psilocin.

Trav:

I have that list too of *Gymnopilus luteus*, *Panaeolus cinctulus*?

Alan :

Pronunciation isn't critical as long as you just pronounce all the syllables and say the names quickly and with confidence - I usually say, "Ploo-tay-us". *Panaeolus cinctulus* and *Gymnopilus luteus* are the most common psilocybin mushrooms in Maine.

Trav:

Yeah, and then *Psilocybe aztecorum*?

Alan:

Yes, it's a species described from the volcanoes that surround Mexico City, but it's found a lot of places in North America. It's a cold weather species.

Trav:

Was this list made by where that mushroom could grow by climate? Or has it been found here and observed here?

Alan:

The mushrooms have been found in the places that they are listed. I don't add stuff to this list just because I think it could grow there. To update the list, I searched mushroom observer and iNaturalist for all *Gymnopilus*, *Panaeolus*, *Pluteus* and *Psilocybe* observations from Maine.

Trav:

Have you discovered any *Gymnopilus* species?

Alan:

What do you mean by discovered?

Trav:

Any new species that haven't been talked about?

Alan:

Gymnopilus is a difficult genus. The work that was done on it was done a long time ago and is mostly based on microscopy which was not very good by today's standards. The microscopic differences between species are not always obvious, and a lot of the type collections have been lost over the years. It's very difficult to take a *Gymnopilus* collection, study it and say, "This one has never been named before," Because with a lot of the names, it's not really clear exactly what they were talking about. I do study *Gymnopilus* occasionally, but I've never found one that makes me think "Oh, wow, this one is definitely new." Because there's so many ambiguous names, most collections probably do have names, but nobody will ever know what they are until all of the holotype collections are carefully studied, and ambiguous names have epitypes / neotypes designated.

Trav:

What are some of the steps for getting into DNA sequencing? How did you start that?

Alan :

Back around 2010, I noticed that almost all of the papers written on new species of mushrooms had information about DNA sequences. I wanted to see if that was something I could do at home, so I started talking to the bio-hacker people who assured me that DNA barcoding can be done at home and isn't particularly difficult. When I heard this, I started collecting equipment. I had met researcher at UC Berkeley named Todd Osmundson, and I was able to give him a few samples to sequence. He was able to get me DNA sequences, but it took a long time, like six months. I asked, "Does it really take six months to sequence a mushroom?" He said, "No, it just takes a couple days, but we're really busy at the lab." So, I volunteered at the lab, helping him out with some of the sequencing. I learned a lot about how to do pipetting and sequence analysis. It was sort of like being a college student, except that there was no homework or tuition.

Trav:

How much did the equipment cost for you to get the ball rolling toward what you wanted to see or what you wanted to find?

Alan:

I didn't really pay anything for equipment because people would just give me stuff they had sitting around. I spent a couple years accumulating equipment. I spent a couple dollars on chemicals and sequencing. If somebody just wanted to start from scratch, you could make a home DNA barcoding lab with used equipment for under \$1,000.

Trav:

That's not bad. What's your favorite part about it? The microscope work, or DNA sequencing, or does it all play a role for you?

Alan:

It all plays the role. The DNA sequencing is really interesting. Especially when you get the results back and you're the first person ever to see where a species fits into the grand scheme of things. Looking at these results is pretty damn exciting. The microscopy can be extremely beautiful and kind of surprising just in the different things that you see in there. You have to put it all together to get the full picture, which is where it gets cool. Once you've done the microscopy, done the DNA sequencing and found it a bunch of times, then the next time you see it, it's like seeing an old friend.

Trav:

Right, because you're seeing it again and again. What's your favorite species to look at under the Microscope?

Alan:

Inocybe are the best. They have beautiful lamellar cystidia, often with calcium oxalate crystals at the apices. They can have very cool shaped spores as well. Inocybe can be some of the most boring little brown mushrooms when you find them, but under the microscope their beauty is absolutely breathtaking.

Trav:

Have you found all of the species of Psilocybe described in literature, or are there some that you are still looking for?

Alan:

No, and I don't think anyone ever will. Some of the species are pretty easy to find. Others are kind of a little bit more doubtful, maybe they haven't been seen in 50 or 100 years. There are no photos of them, and when you read the description it's not really clear which mushroom they're talking about. Often, it's hard to tell if it's a species that ever existed at all. Often the old literature has mistakes. So, if you did find a species described long ago and did a careful microscopy, you could measure the spore size and think, "It's definitely not this one because the spores are a different size," But actually it was just published wrong. A lot of those old names are relatively dubious, so you definitely couldn't find all of the psilocybin mushrooms. On the other hand, there are some species that I know are valid. Either because there's photos or a convincing description of them, or there is genetic evidence that they exist in Genbank.

Trav:

Do you think that mushrooms are going to change due to climate change? Do you think we start seeing different kinds of species due to climate change?

Alan:

Oh yeah, absolutely. There's a metric shit-ton of ecological pressure on fungi due to climate change. A lot of species are moving north, or moving up in elevation. A lot of stuff will go extinct if its habitat doesn't exist to the north or there are no higher elevation places for them to go. There will also be some evolutionary pressure so they will evolve, so some species will adapt to be able to withstand higher temperatures or less precipitation.

Trav:

Are there any rare species that you've noticed in your area?

Alan:

Often, I find something and say, "Wow that's really rare here." It's pretty common to find rare mushrooms. Every day I go out I find at least one thing that's pretty rare, or at least outside of its native range. Today, I found an undescribed species that's going to be named *Albogymnopilus nanus*. It's kind of like a *Gymnopilus*, but it has a viscid cap and it's very fragile. It's a really strange mushroom and super rare, known from just a handful of collections. I found it right on the side of the trail today, and there was only one of them.

Trav:

Where can people find or buy equipment for DNA sequencing? What's a good website that you think people would like?

Alan:

I get a lot of stuff from eBay. I like eBay better than Amazon, because I think more of the money goes to the actual seller. Jeff Bezos is rich enough, and he doesn't treat his employees particularly well. On Ebay you have to make sure you're buying it from a reputable seller. If someone signs up and they only have sold two things before they're likely to burn you. It's also really important to make sure that the stuff you buy has a 30-day return policy so you can send it back if it's not good. Especially equipment like a PCR machine. If you're careful about who you buy from, eBay is an excellent source for DNA sequencing equipment. There's also a company called The Odin, which is a bio-hacker supply company which sells a lot of equipment and chemicals useful for DNA barcoding.

Trav:

How much time do spend studying mushrooms in a day do you think? Even the search, about how much time?

Alan:

Probably about 12 hours a day on average. For me, it's not really work, it's fun. I'm always looking for mushrooms and working on my photos and hanging out with cool mushroom people.

Trav:

That or it's something you love too. It's not just work for you. It's like you said, "It's play. It's fun. It's your future."

Alan:

Yeah, it's interesting. It's this cool thing that I can do that is both fun and helpful to other people. I figure I might as well work on this stuff, or else I'm kind of wasting my time.

Trav:

Did you think that when you first started studying mushrooms that you'd be this far into it?

Alan:

No, but I always get really into my hobbies, so I'm not particularly surprised.

Trav:

right? Yeah, dive right in, right?

Alan:

Yeah, I mean, if you're going to do something you might as well throw everything you have at it. Otherwise, you're just never really going to get anywhere.

Trav:

Right? Do you spend a lot of time at home or are you always traveling?

Alan:

No, I do not spend much time at home. Last time I was at home was three weeks ago, and I was only there for a couple of hours. Since then, I've been mushroom hunting all day in Washington. Tomorrow night I'm going to go home, and the next day I am heading to the Netherlands.

Trav:

Do you feel like you have a lot of work to catch up on? Are you pretty good at keeping up with all of this stuff.

Alan:

No, I'm so far behind. I think to most people, it looks like I'm very productive because I'm always discovering things and posting things. To me it seems like I only am able to do about 1% of what I would like to do. For example, yesterday, I took about 800 photos and I got about 100 of them processed and uploaded, saving 700 for another day. Then today, I took another 1000 photos and maybe I'll get 200 of those done if I am lucky. Most days I take about 1000 photos and get none of them online. The next day, I do it again. Maybe when I am 80 I'll process all the photos. To really study a collection that you make can take usually somewhere between half an hour to four hours. I like studying the stuff I find, but I'm making a lot of collections. On a typical day I make 10 or 20 well documented collections. There's not enough time in the day to study all of those. I need a research team. I really enjoy wasting a few hours in front of the microscope. It's super fun trying to get the best microscopic pictures I can, but damn it's fucking time consuming. That's just one collection, and there's so many more. There's always more to do, but I'm totally fine with not getting everything I need to do done. Most of the stuff that I need to do, nobody knows that I need to do it except for me, so no one is going to complain at me if it doesn't get done. I am usually so distracted with all the new stuff coming in that I don't really have time to be sad about the stuff I'm not doing.

Trav:

Do you do get lost into the microscope is that your little escape from all the other stuff that you might have to do?

Alan:

That's not the way I think about it really. There's very little that I have to do. It's more like there's hundreds of things that I want to do. The microscopy is really interesting. Seeing all those features are stunningly beautiful. Mushrooms look really cool on a macroscopic scale. They all have all those different shapes, forms and colors. It's the same at the microscopic scale. They look super cool.

Trav:

When you're looking at the gills, when you say, "Gill face" are you talking about the gill blade itself, and then you're looking at the very edge to find the basidia? Is that how that works?

Alan:

Usually what I'll do is use a forceps to grab just one gill. I'll set that down on a microscope slide. From there, there are two important parts to study. There's the gill edge, the part of the gill that used to be facing the ground. Then the gill face is basically the side of the gill. I like to cut the edge off with a brand-new razor blade, leaving tiny piece like half a millimeter long and a 10th of a millimeter wide. Then I cut what's left of the gill in half, throwing away the part that was near the gill edge. What's left is the gill face. The gill edge has cheilocystidia and then the gill face has pleurocystidia. Basidia are most common on the gill face.

Trav:

Interesting. I just bought my microscope and I haven't touched it yet. I opened it out of the box and I'm still waiting to mess around with it. I just don't want to break it.

Alan:

Microscopes are pretty hard to break. Often, I'll let kids use my microscopes unsupervised and none of them have ever done anything that has damaged them. You do want to be careful to not get immersion oil on your 40x objective, that's pretty easy to do. Once you put immersion on the coverslip, just be careful not to put the 40x objective back on the slide. You probably will anyway and that's okay, you just clean it off with isopropanol. Make sure to clean the oil off your oil objective at the end of the day so it doesn't just cake on there. Usually, microscopes get broken by getting dust inside of them. So, if you don't ever remove the eyepieces they stay pretty sealed up and there's not a lot that can go wrong.

Trav:

One of the questions I got from somebody else is, have you ever been caught picking illegal mushrooms by a warden or park rangers or anybody?

Alan:

No, no one's ever really yelled at me for picking mushrooms. One time I was picking *psilocybe cyanescens* on the side of the highway. The police officer pulled up and asked what I was doing. I said I was picking mushrooms and he said, "Okay, well there's no pedestrians allowed on the highways. See that sign over there says no pedestrians?" I said, "Oh okay, I'll stay on the other side of that sign." He didn't ask what kind of mushrooms I was picking. I'm sure if I had tried to hide the mushrooms or acted sketchy, he would have figured out what they were. We usually carry backpacks instead of baskets out west because you're not allowed to pick mushrooms pretty much anywhere. I spend a lot of time photographing mushrooms - the actual picking is very quick compared to all the time I'm sitting there with the camera. I'll probably get caught one day, I'm not particularly worried about it.

Trav:

Right. Yeah, if you don't worry about it, then most of the time you're good.

Alan:

Yeah, they tend to pay attention to sketchy people who act like they are doing something wrong.

Trav:

What got you into mushrooms? Did someone lead you into it, a family member or a friend? Or was it something you've just picked up on?

Alan:

I went hiking on Christmas Day 2001 and there were a ton of mushrooms around. I decided I wanted to learn which ones were edible, which ones are poisonous, which ones were rare or which ones were hallucinogenic. I started taking a closer look at them and taking pictures. I figured somewhere out there, there must be people that knew how to identify these things. Back in 2001 those kinds of people were not very easy to find. I learned a lot at the beginning by editing Wikipedia. Doing all the research to write the Wikipedia articles was really educational. Eventually I started going to the fungus fairs and forays. I have always enjoyed nature, but it seemed like kind of a waste of time to go hiking. I said to myself, "Okay, I'm out here and it's beautiful, but what am I doing with my life?" Being able to have a goal, like to get the best picture I can of every species of mushroom out there, made me feel a lot better about spending a lot of time in nature. That's worked out really well because now I'm pretty much supposed to be in nature all the time and I feel like I am being productive out there.

Trav:

When did you start to get good at mushroom hunting?

Alan

I don't think I was very good at it until 2007 or so. All my pictures that were taken before 2010 are absolutely terrible.

Trav:

When Facebook first started did you create a group?

Alan:

I didn't really get on the bandwagon too early with creating groups. I created one called "Mushroom identification" around 2014.

Trav:

Are you planning on writing a book or doing a poster or doing anything that the public can access to buy?

Alan:

I've always been telling myself I'm working on writing a book, but I'm not sure that I really am. I think maybe I was just telling myself that so I wouldn't feel like I was wasting my time taking all these pictures. I think I might be working on a book on psilocybin mushrooms with Caleb Brown. We have a Google Doc. I saw Caleb just a couple of days ago. He's continuing to work on it. He said he'd be really happy if I did too. So, I'm going to try to find time to do that. I don't know if anyone really reads book reads books anymore. These days all of the really good information is on the internet - in various web pages, Mushroom Observer and iNaturalist.

Trav:

Right, right. But what about a poster?

Alan:

Yeah, I like posters. Recently, I've just been like taking photos that I like and printing them out. Usually on metal. A poster with all the psilocybin mushrooms of North America is something I'm slowly working on. I probably should make more posters because I already spent all the time taking the photos, it wouldn't take much longer just to throw them together into a poster.

Trav:

I buy a lot of mushroom posters, the old ones and then all the updated names. Posters of mushrooms. I have them in the kitchen. In my little I have a little cubicle for all my mushroom stuff. I collect them. People have made money selling them.

Alan:

Mushroom posters are cool. I definitely should make some. Just keep reminding me to do that.

Trav:

Keep reminding you. Definitely will. I really liked your little - is that metal? That is in your lab with all the mushroom photos on him?

Alan:

Yeah, those are printed on metal and I use a place called Artbeat Studios for that. It's great - you just upload a high-resolution image and they send you a piece of aluminum with your photo printed on it. They look really nice and hang easily on the wall. Occasionally I'll get them done on acrylic or glass. I'm usually too busy hunting mushrooms to sell them though.

Trav:

Yeah, it's beautiful. What's your favorite part about mushrooms? Is it the hunt? Finding them doing the photos? Figuring out what it is? Or is it collectively all of that?

Alan:

Oh, definitely collectively all of that. Plus, there's a lot of good people who like mushrooms. It's nice to hang out with the people that you have something in common with, folks who are into nature. I like getting a lot of exercise out there - seeing different habitats and traveling long distances to find something rare and go to someplace that people almost never visit. I like seeing all the different organisms that are in these obscure habitats and getting really nice photos of them is really satisfying. Being able to share them and try to inspire other people to do the same thing is great.

Trav:

When mushroom season is here, I'm either working or in the woods. What do you do in the off season?

Alan:

In the off-season for me I like doing microscopy and DNA sequencing, working on the stuff you found during mushroom season could easily fill a winter. Though for me, there's really no off-season because if you travel around a little bit, it's always mushroom season. In California, where I live, November, December and January is the season on the coast. May, June and July is the season up in the mountains. Around June the mushroom season starts in Mexico and the East Coast of the

United States which continues through November. By traveling around, there really are no months of the year that I'm not in some place where the mushroom season is really good.

Trav:

You mentioned your next place you're going to is The Netherlands? What are your plans out there?

Alan:

I actually didn't make any, I got sent there by my work. I decided not to ask why, it will be a surprise. We have a laboratory out there. I think maybe they are sending me out to meet people.

Trav:

That's awesome. What's your next move after that? If you have one. Are you going back home to California?

Alan:

Probably California. I don't really try to make plans in advance too much. That way I can just do whatever seems like the best thing to do. I'd really like to hunt mushrooms in Europe, but it might be around the end of the season there. I would like to have some down-time, to process all these photos that I've taken over the past few weeks and years and months. I was in Mexico for three weeks this year and took thousands of photos there. Most of those need to be processed. I was just in Washington for a couple of weeks. I found a lot of really good stuff. Those all need to be processed. There are a whole bunch of new DNA sequences that came in so those need to be processed and added to the Mushroom Observer and iNaturalist observations and uploaded to Genbank. There's a ridiculous amount of stuff to do, even if I don't find any more mushrooms for the next several years.

Trav:

What's your favorite mushroom to consume?

Alan:

Amanita velosa.

Trav:

Velosa?

Alan:

Yes! It tastes like a cross between lobsters and scallops.

Trav:

And the most interesting mushroom you have found to date?

Alan:

They are all so different, I don't know if you could say there's one that's more interesting than others. I suppose one that stands out is *Wrightoporia austrosinsis*. This is a crust fungus that grows on the underside of logs in Georgia, USA, and China. It's a white crust fungus with little pores on it, about as boring as you could possibly imagine, but if you grab it and pull it, it stretches like bubble gum. If you pick apart the log, it's like the whole damn thing is made of bubble gum. It's just so unique and like nothing you would expect from a mushroom. I made a few videos of it, I could find them if you're interested.

Trav:

That is interesting. I've never heard of that. I like *Mycena epipterygia* because it has a coating on the stem. When you crack the stem, there's a really nice slime layer that doesn't let you separate the stem. You can really pull on it and it will separate but if you just crack it, it will still be connected.

Alan:

Yeah, the cap has that too. On the foray I lead today I was peeling the cap and showing people the separable, gelatinous pellicle. I like to find this species because the real *Mycena epipterygia* was described from Italy. All of the DNA sequences from North America are way different than the European sequences. So, what we have in North America doesn't have a name, and it's a species complex of several different ones. They also look pretty cool in the blacklight, the stem glows bright orange which is unusual for *mycena*. *Mycena* in general are really good. I also like *Mycena filopes* - it smells like iodine and has a really cool rhizomorphs at the base of the stem and is also a new species because the real *M. filopes* is way different than North American stuff. *Mycena* in general have very beautiful microscopic features, and they're a lot of fun to find. It's also a very large genus - very mysterious, with a lot of new species and a lot to be discovered.

Trav:

I like *mycena* too. They're very small, hard to find, but when you find them, they're pretty. What is your favorite place to forage? What state do you have a, "Go-to" spot every time?

Alan:

Wherever it's been raining the most or wherever the fungus fairs are happening. If the rains are good, any place will be amazing to forage in. If the rains have not been good, anywhere you go will be bleak. I've seen really good foraging in Michigan and California and Mexico. I wouldn't say any specific place is my favorite.

Trav:

Do you have any suggestions for new mushroom hunters?

Alan:

Oh man, so many. Probably the first thing I tell everybody is to take pictures of all the mushrooms you find especially the underside and put them on iNaturalist. If you have a cell phone, you can use the iNaturalist app to take the pictures. That way you don't have to remember to upload them later. That way you create permanent biodiversity records and real people will see your mushrooms and be able to learn stuff from the photos and identify them for you. iNaturalist is a really good app that aims to connect people to nature and also ends up connecting people to each other. Also, Facebook, ironically, is a really good website for mushroom discussion. As far as I can tell, it's the best website on the internet for mushroom discussion because of all those Facebook groups. A lot of Facebook groups are really stupid, but a lot of them are really awesome.

There's also a bunch of cell phone apps that are really useful. There's Strava, spelled S-T-R-A-V-A. It is a free app that tracks you via GPS. So as long as you remember to start it when you park your car, you'll never get lost in the woods because you see this blue line that shows you exactly where you've walked. There also are apps that show you like where the cell phone towers are (Cellmapper). You can find campsites that have fast internet and do all your uploading of photos and stuff like that from out in the woods.

I would say that some good advice for beginners is to pay close attention to the mushrooms, whenever you see a mushroom, pick it up, take a close look at the underside, taste, smell it, note the

trees around and just get really familiar with all aspects. Also, going out with people that have been hunting longer than you have is a really good thing. I take a lot of people out hunting - today we did a foray with a group called Decriminalize Nature Humboldt, and about 50 people showed up. Five or ten of them were experts, it was really helpful to have those guys around. The fungus fairs are really good - they have all the species out on display. On the day before the fungus fair, all the identification happens. All the forays return with mushrooms and the experts gather to put names on everything, and that's where the real learning happens. When the experts are explaining why they want to apply this name over some other name and identifying thousands of mushrooms as they come in, you can learn a lot really fast.

Trav:

How many walks do you lead a year? Do you think?

Alan:

It's really random - whenever I have time and the season is good. I've led walks every weekend for the past 5 weeks.

Trav:

Yeah, do you get requested a lot?

Alan:

Yeah, a lot. Usually, when I lead a walk, it's because somebody requests it. They'll ask, "When's the next walk?" I'll reply, "How about Saturday?" Then I'll invite the whole internet.

Trav:

Have you ever had a group of people pay your whole way and then pay you to do a walk and then ship you back and pay for everything?

Alan:

Yeah, that's pretty common.

Trav:

I hope you come out this way again at some point. I know you mentioned a while ago that you did need to come back up to Maine, it's been ten years or so for you.

Alan:

Yeah, there's definitely good stuff there. One thing that's kind of hard is that it's really hard to know when the season will be good in advance. You can know a couple weeks in advance, but a lot of times these events need to be planned months in advance.

Trav:

Yeah, that's true. Yeah, it's kind of like you said, you just shout out on Facebook and say, "I'm doing a walk here. If you can make it, show up". But I think if you came out this way, it would be a huge hit just on the sole fact that we don't have any festivals. We don't have any big names doing walks for us out this way. That's just my opinion, but like you said, the last three years have been really dry, but this year has been insane for mushrooms. 2013 We had a really good year too, but it's hit or miss for me.

Alan:

So yeah, that's often how it is, some places are more reliable than others as far as the rain.

Trav:

I know some folks in Oregon. They call it the, "The wet state." It's always raining. It's always wet. That area is good, obviously.

Alan:

Yeah, the Oregon coast, gets a lot of moisture.

Trav:

Okay, so my final question for you is a bit of a humor question. Have you ever seen Bigfoot?

Alan:

No, I don't believe in Bigfoot. I'm very skeptical in general - if there is any conspiracy theory out there, I automatically do not believe in it - doesn't matter what it is. Bigfoot, not real. Aliens probably exist, but they have never visited Earth. 9/11, not an inside job. I actually am really interested in conspiracy theories and I research them more than I should - it's kind of a fun thing to study.

This concludes the interview with Trav David and Alan Rockefeller.