

Next Meeting June 8th, 2009

# SPORES Afield

The newsletter of the Colorado Mycological Society

June 2009

The President's column is on page 7 this month

## June Amanitas: From Deadly

to Delicious

Speaker: Debbie Viess



Amanitarita — otherwise known by her husband and her friends as "Debbie Viess" — will share with us her passion for the Amanita mushroom species. We will learn that they are not all to be shunned.

Debbie Viess is a biologist, writer, and artist who has studied and drawn inspiration from wild mushrooms for over fifteen years. An expert on the amanitas of California and the former education chair for the Mycological Society of San Francisco, Debbie gives popular talks and slideshows throughout the Bay Area and across the nation. She has taught mushroom field classes through a variety of organizations, including the California Academy of Sciences, the Oakland Museum of California, Pt. Reyes Field Seminars and the Golden Gate

Audubon Society.

She was a major contributor to all five of the original Pt. Reyes Mycoblitzes. Her work has been published in numerous online and paper publications, including "Mushroom, the Journal of Wild Mushrooming" and "Bay Nature". She is a Contributing Editor to FUNGI magazine, and publishes frequent, mushroom-flavored essays on the BAMS discussion group: bayareamushrooms@yahoo.com as well as on the listserves of mushroom clubs across the nation.

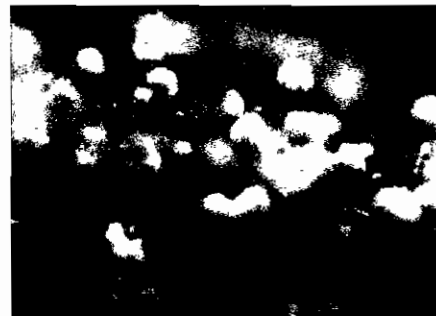
In 2006, she and her husband David Rust founded the Bay Area Mycological Society, a science-centric mushroom club based in the East Bay. She strongly believes in having fun with fungi, and combines her knowledge of fungi with her illustrations and photos to create engaging and entertaining programs. She last visited Colorado in 2006 to present at the Crested Butte Wild Mushroom Festival, and greatly enjoyed the splendid diversity of fungal forms in our breathtakingly beautiful state. She is grateful for this opportunity to do so again.



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## Paleomycology: Discovering the fungal contemporaries of dinosaurs

by Christine Layton, reprinted  
with permission from the Cornell  
Mushroom Blog



Almost everyone has been to a museum like The Smithsonian and seen firsthand the relics of our planet's evolutionary past. Most of the fossils we find belonged to creatures that have long been extinct, but many of those bear a striking resemblance to organisms we share the earth with today. As with the fossilized remains of plants and animals with which most of us are familiar, fungi that existed millions of years ago have also been preserved and can be studied by paleomycologists — that special breed of mycologist who studies fungi in the fossil record.

Some of the most fantastical discoveries of ancient fungi have been in amber. Amber comes from certain species of trees whose sap was able to resist decay and weathering, and thus hardened and became fossilized over millions of years.

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## 2009 Foray Schedule

### May 30th (Sat.) —

#### **Snowbank Mushroom Foray**

The annual Snowbank Mushroom Foray will be led by Christy Honigman (christy@christyhonigman.com: 303-522-1402) and Rob Hallock (rob.hallock@uchsc.edu: 720-480-4452). We will be hunting for mushrooms in snowbanks so dress appropriately. Appropriate footwear (hiking boots) is required. We hope to find many of the mushrooms that we talked about during the May meeting on snowbank mushrooms, so please join us.

We will meet in Boulder at the north east corner of the Safeway parking lot (corner of Arapahoe and 28th) for a 9:30 a.m. departure. Please note that both the time and location are exceptions to our usual time and place.

### June 7th (Sat.) — Foray with Amanitarita

Our June speaker Debbie Viess, better known as "Amanitarita", will join us on a foray in search of black morels...if the season permits...or snowbank mushrooms. A couple of weeks prior to the foray we should have a better idea of what we will be looking for. We will keep you posted here with the latest information. The meeting place will be our usual place.

### August 14th (Fri.) — Fair Foray

We will be collecting specimens for the CMS Annual Mushroom Fair (Sunday, August 16th). It should be emphasized that this is not a teaching foray, but rather a collecting foray. Nevertheless, people who have participated in this foray in the past have found it very informative. The leader of this foray will be Ellen Jacobson. If you need more information, you may contact Ellen at 303-741-3836 or by email at egi538@aol.com. The meeting place will be our usual place.

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## 2009 Foray Information

\* **When** — Most forays are on weekends and most start at 9:00 AM and run to around 2:00 PM.

\* **Where** — CMS has a new meeting place for forays. The good news is that it is in the same area as the old meeting place but usually is not so crowded. Future CMS forays, unless otherwise stated, will meet in the SE parking lot (Stegasaurus) at Exit 259 (I-70/Morrison). Coming from Denver on I-70, take Exit 259. At the end of the off ramp turn left (south, towards Red Rocks and Morrison) and pass under I-70. You will see the SE parking lot immediately on your left. We will always try to gather towards the rear of the parking lot.

\* **To Join Our Forays** — CMS conducts several day-trip forays each season for its members. However, guests of CMS members and others interested in learning about mushrooms and our myco-club may participate in a foray by paying a \$5 fee — paid to the foray leader in cash or check (payable to "CMS"). Non-members may also join CMS and go on a foray by giving the foray leader a check made out to "CMS" for \$28.00.

\* **Car-pooling Preferred** — Please note that car-pooling from the meeting area to the foray location is strongly encouraged. It is often difficult to find a place where several cars can pull off the road together to foray. Car-pooling is a good chance to meet and talk with other CMS members on a one-to-one basis. Try it, you'll like it!

\* **Come prepared** — Remember that you will be going for most of the day into the mountains. Be prepared! Bring your lunch and drinking water. Bring clothing appropriate to the changing weather conditions in the mountains (i.e., rain gear, sweater, jacket, etc.). Wear sturdy footwear.

\* **Bring proof of membership** — Be sure to bring your CMS membership card or a copy of SPORES Afield (with a mailing label addressed to the member) with you whenever you show up at a foray. Those without a card or other proof of membership or those who haven't paid the \$5 non-member fee will not be allowed to come along.

\* **Check in advance** — It is always a good idea to check with the foray leader a few days prior to the foray for last minute changes.

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## Upcoming Events

**June 8th** — Amanitas: From Deadly to Delicious  
Debbie Viess — otherwise known as "Amanitarita" — will share with us her passion for the Amanita mushroom species. We will learn that they are not all to be shunned.

**July 13th** — Truffles with speaker Jack States.

**August 16th** — CMS Annual Mushroom Fair  
Chief Identifier: Cathy Cripps

**August 17th** — Cathy Cripps (Topic TBA)

**September 14th** — CMS Annual Cook 'n' Taste  
The annual CMS "smorgasbord" of mushroom dishes served up by CMS members is always greatly anticipated. However, this year CMS member Pete Marczyk will be preceding the fungi feast with a talk on cooking with mushrooms and choosing the right wine for your mushroom dish.

**October 12th** — CMS Annual General Meeting



(Paleomycology, continued from page 1)

Anything (including fungi!) that became trapped within the sap before it hardened became completely preserved— just like a time capsule. Amber deposits exist worldwide, but two of the most important are on the coast of the Baltic Sea and in the Dominican Republic. Both of these deposits differ greatly in age: Baltic amber dates around 35-55 million years old during the Eocene, or at about the time that the first modern mammals appeared, whereas Dominican amber is from the Miocene (about 15-20 million years old), making it about half the age of Baltic amber. This important age difference gives us snapshots of two completely separate periods in our planet's history, a real boon for evolutionary biologists.

Many insightful discoveries have been made about what fungi were like millions of years ago. It seems that while many of the fungi that existed back then clearly differ from the ones that exist today, the fungi of today bear a striking physical resemblance to their ancestors. And from



what we can tell, it seems that ancient fungi walk the same walk and talk the same talk as their modern counterparts, too. Many fungi are parasites — of

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plants, of insects, and even of each other. So, it is not surprising that we should find them doing the same things in the fossil record.

One of the more well-preserved specimens of a fungus in amber comes from a piece of Baltic amber that contains a springtail (an arthropod closely related to insects) which is likely being parasitized by *Aspergillus collemborum*, a previously undescribed species. The sporulating fungus is so well-preserved that the individual conidiophores (spore-bearing structures), complete with conidia (spores), can be clearly seen erupting from all over the body of the springtail. Using these physiological characters, it was placed in the modern genus *Aspergillus*, whose species are primarily saprophytic. However, some species are known to be facultative parasites of insects. Because *A. collemborum* is the only fungus on the springtail, as well as the fact that the springtail was not decomposing when it was trapped, it is likely that the *Aspergillus* was acting as a parasite and not a saprophyte. Investigating fungi trapped in amber is almost like figuring out what happened to a victim in CSI, since you have to follow the clues from what happened at the time of death to really figure what the fungus was doing, its identity, and perhaps even how it lived.

There have been some other remarkable finds of parasitic fungi of insects in amber. In Dominican amber, a mosquito was found with several types of parasitic fungi growing on its outside cuticle. What is interesting is that the fungi resemble

modern day fungi in class Trichomycetes, which are common gut-inhabiting Zygomycetes of insects, but they differ from Trichomycetes in that the fungi are on the outside of the insect rather than the inside. If the fungi are indeed Trichomycetes, this could be important for figuring out when the ability to live in insects' guts was acquired in the lineage. Another interesting find, this time in Baltic amber, is of a parasitic fungus consisting of four club-shaped fruiting structures erupting out of the thorax of a stalk eyed fly. What's really neat is that the fungus physiologically closely resembles a modern day Laboulbeniales, which are obligate parasites of insects and are often very host-specific. Since the fungus was found on a fly, it was able to be placed in the modern genus *Stigmatomyces*, which is specific to flies. This fossil, which is the oldest record of an insect-parasitic fungus, shows that these host-specific insect pathogenic fungi have existed for tens of millions of years.

Now probably one of the coolest fungal finds in amber has to be from a piece of Burmese amber dating to about 100 million years old, or around the time when the dinosaurs were in their heyday. Within this piece of amber is a fungus parasitizing a fungus that is parasitizing yet another fungus. You heard me right: three fungi eating and being eaten by one another. I should also probably mention that the piece of amber in which this was all found is itself smaller than a grain of rice! In the amber is the cap of the Basidiomycete *Palaeoagaracites antiquus*,

(Paleomycology, continued on page 8)

# Charles McIlvane and his Fungi

by Rob Hallock

I purchased a mushroom book a few years ago entitled *One Thousand American Fungi* by Charles McIlvane, and found quite a pleasant surprise inside the book. Before going further, I should give a brief introduction of McIlvane. McIlvane (1840-1909) was from Pennsylvania and fought in the Civil War, where he rose to the rank of captain. After he retired from military service, he moved to West Virginia to write and pursue his mycology interests. In 1900, he published one of the first American mushroom field guides that was accessible and written for the general public, "One Thousand American Fungi." He was into eating mushrooms – all kinds of mushrooms, and is appropriately referred to as the grandfather of American mycophagy. He is referenced in nearly every present day mushroom book, often following the description of a given mushroom with a phrase that cautions against eating it, and then continues with something like "but McIlvane ate it." David Arora describes him well; "Captain Charles McIlvane (the plenipotentiary extraordinaire of turn-of-the-century toadstool tests)."

McIlvane describes stink horns, "*Phallus impudicus* makes itself known wherever it grows. The stench of the full-grown plant is aggravatingly offensive, attracting blow-flies in quantities, and the carrion beetle *Necrophorus americanus* ... When in the egg-shape it is white or light dull-green, semi-gelatinous, tenacious and elastic. As many as a dozen sometimes grow in a bunch, each from a peculiar white, cord-like root or mycelium. They look, when young, like bubbles of some thick substance. In this condition they are very good when

fried. They demand to be eaten at this time, if at any." Larry Evans fried some of these up for me once; if you can make it passed the slimy texture of the gelatinous goo inside, the grainy texture of the spore mass, and the dull-green color, they aren't that bad.

McIlvane includes several species in his list of edibles that are clearly inedible or even known to be poisonous. This list includes *Russula emetica*, *Hypholoma fasciculare*, *Omphalotus illudens*, several toxic *Clitocybe* species, and two dozen *Cortinarius*. He describes *Clitocybe illudens* (now called *Omphalotus illudens*), "this fungus is so inviting in quantity and beauty that one turns from it with a regret that lingers. Eaten in quantities it acts upon some persons as an emetic. I have several times eaten of it without other than pleasurable sensations, but persons partaking of the same cooking have been sickened." He also describes eating several *Clitocybe* species known to contain muscarine, which is a toxin that results in perspiration, lacrimation, salivation, and fluids simultaneously flowing from every other orifice in the body, as well as muscle spasms and a precipitous drop in blood pressure. Symptoms start 15 to 30 minutes after ingestion and death can result from respiratory failure. Atropine is the antidote.

Muscarine containing mushrooms include a number of *Inocybe* and *Clitocybe* species, several of which McIlvane reported as edible. For example, he reported *Clitocybe dealbata*, commonly called 'the sweat producing *Clitocybe*', as not just edible but a good edible. "Its top is exceedingly like ivory. Its charming flavor is exceeded by very few other fungi. Stevenson." Lincoff and Mitchel (1977) refer to this particular example, "it is pure speculation as to what species McIlvane and others

actually did eat". I'd propose that McIlvane relied on Stevens report on this particular species and may not have even tried it himself, as McIlvane often gave credit on edibility statements throughout his book. However, McIlvane also describes eating *C. rivulosa* 'flavor fine', *C. cerussata* 'edible. good', and *C. truncicola* 'good quality' while they are also known to contain muscarine and are therefore toxic. Bigelow (1982) describe the taxonomic mess surrounding the historic treatment of *C. dealbata*, its subspecies, and related species. Again, no one really knows what McIlvane ate. These inconsistencies aside, his book was a marvelous compendium of fungi and knowledge at the time. The importance of the book to the modern state of amateur mycology cannot be overstated.

McIlvane's original book was published in 1900 with a limited edition of 750 hand-signed copies, followed by reprints in 1905 and 1973 (the CMS library has the 1973 edition available to lend out to members). The 1900 edition costs sells for around \$250 when you can find it, while the newer 1973 edition is listed on the popular internet sites for only \$5.

As soon as I received my copy and opened it up, I found an envelope within the first few pages. It had a two-cent stamp on it and was postmarked Oct 17, 1900. It is addressed to Mr. James D. Colt, Chestnut Hill; Mass from Charles McIlvane, Colebrook PA. A small note written in the margin of the book next to the envelope read "See page 233." I curiously turned to page 233 and found the letter that was originally in the envelope, which was typed and signed by McIlvane himself.

(McIlvane, continued on page 7)

(McIlvane, continued from page 6)

The letter in its entirety:

"Colebrook, Pa., Oct. 17, 1900.  
Mr. James D Colt.

Dear Sir:-

Thank you for your report upon the  
fungi on Cape Breton Island.

Will you kindly inform me whether you  
find *Cantharellus cibarius* fragrant with  
the perfume of apricots. As you will  
notice in my book I find this delicious  
perfume present west of the  
Alleghenies, but not east of them.

(signed)Sincerely yours,  
Charles McIlvane."

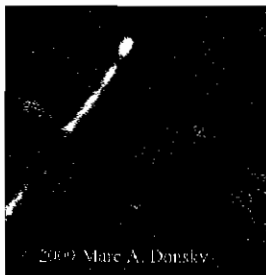
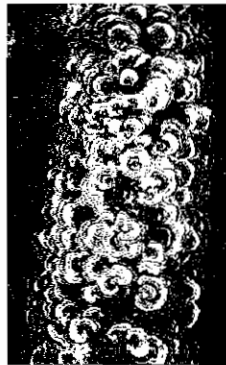
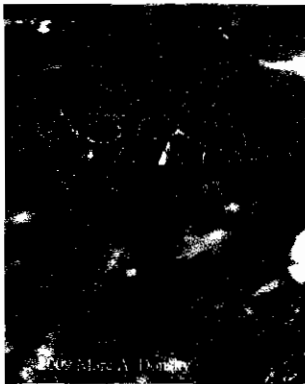
In the text of his book, McIlvaine reports that Chanterelles he found in the West Virginia mountains in 1881 were "fragrant as ripened apricots" (p. 214), but continued with "the smell of apricots is not always clearly perceptible in American specimens" (p. 215). It seems that McIlvaine may have privately recognized an odorous and non-odorous variety of the golden Chanterelle. It is clear that Chanterelles from both Western and Eastern states, as well as European varieties, all have a fruity apricot-like odor. However, the notion that certain populations of Chanterelles do not have the prominent odor, due to

genetic variations or environmental conditions, is not all that unlikely. Although we may never know what McIlvaine was thinking, as long as his documents keep turning up, the question is worth consideration.

References:

Bigelow H.E. 1982. North American species of *Clitocybe*. Part I. J. Cramer, Germany. Lincoff G. and Mitchell D.H. 1977. Toxic and hallucinogenic mushroom poisoning. Van Nostrand Reinhold Company, New York. McIlvaine C. and Macadam R.K. 1900. One thousand American Fungi. The Bowed-Merrill Company, Indianapolis.

The president's column is visual this month.  
Group and describe the following images.



(Paleomycology, continued from page 3)

whose gills are covered by the hyphae of the mycoparasite *Mycetophagites atrebora*. And amazingly, inside of the hyphae of that mycoparasite are the hyphae of the hypermycoparasite *Entropezites patricii*. All three fungi were described as new genera and species from this single sample. The specimen is so well-preserved that portions of *P. antiquus*'s gills appear to be liquefying from toxins released by *M. atrebora*. Nowadays such complex and sophisticated levels of parasitism are known amongst fungi, but the fact that they were so well-established some 100 million years ago is simply astonishing.

But really, why do we even care about all of this? Knowing what kinds of fungi were out there and getting a glimpse of what they were doing millions of years ago is vital to the understanding of the evolutionary histories of the species we have around today. While we may have a good understanding of the relationships

between many plants and animals, we know relatively little about the true evolutionary history and relationships of most fungi. A recent phylogenetic study using highly conserved DNA has shown that the morphological characters — primarily those of fruiting bodies — that we use to identify fungi are far from perfect at revealing the true evolutionary relationships between groups. It's become quite clear that some traits once considered to be homologous, like the presence of gills or an enclosed sac-like fruiting body, have evolved multiple times in different phylogenetic lines, making them analogous and not homologous traits. By "filling in" the blank spaces of the past with clues from fossilized fungi, we can develop a better understanding of not only how long fungi have been filling certain ecological roles, but also when major fungal lineages diverged. Through the differences between ancient fungi and their modern counterparts, we can start to grasp when certain traits evolved and ultimately learn about the true evolutionary relationships

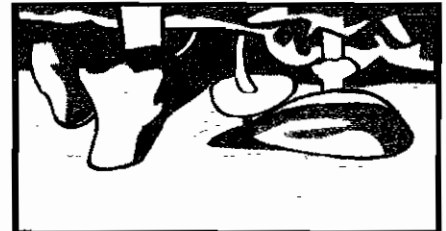
among modern fungal taxa.

We'd like to thank Dr. Alexander Schmidt of Humboldt-Universität zu Berlin for allowing us to use his fantastic images of *Aspergillus collembolorum* from Baltic amber. Please note the images in this post are copyright protected and are used with permission.

1. Poinar, G.O. 1998. Fossils Explained 22: Palaeontology of amber. *Geology Today* 14(4): 154-160.
2. Darfelt, H. and Schmidt, A.R. 2005. A fossil *Aspergillus* from Baltic amber. *Mycol. Res.* 109(8): 956-960.
3. Poinar Jr., G. Poinar, R. 2005. Fossil evidence of insect pathogens. *Journal of Invertebrate Pathology* 89: 243-250.
4. Hughes, M. et al. 2004. Stigmatomyces from New Zealand and New Caledonia: new records, new species and two new host families. *Mycologia* 96(4): 834-844.
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