

Next Meeting Oct. 12<sup>th</sup> 2009

# SPORES Afield

The newsletter of the Colorado Mycological Society

October 2009

## October Spores President's Column



### "Tree Killer Fungi"

We love to eat mushrooms. However some mushrooms and other fungi love to eat trees. Here is a very brief survey of some of the most devastat-

ing fungi (not necessarily mushrooms).

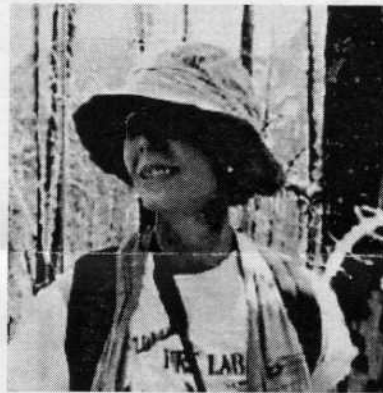
White Pine Blister Rust, *Cronatium ribicola*: Our last speaker of the year will be Professor Diana Tomback. She will talk to us about this devastating infection. Blister rust was introduced into North America near the turn of the century (1900) from a tree imported from Europe. It is a multi-host fungi belonging to the Division Basidiomycota. It has caused forest devastation from Canada southward. It kills Five-needle pines, including Western White Pine, Sugar Pine, Limber Pine, Whitebark Pine, and Bristlecone Pine. It has just recently been reported in Rocky Mountain National Park (personal communication Diana Tomback).

Blue Stain Fungi, *Ophiostoma clavigerum*, *O. montium*: there are actually a number of genera and species of pathogenic Blue-stain Fungi. This is the fungus associated with the mountain pine beetle *Dendroctonus ponderosae*. The beetles carry this fungus and infect the tree. The fungus damages the phloem layer and prevents transport of nutrients killing the tree.

(Continued on page 4)

## Speaker for the October Meeting:

Diana F. Tomback, Ph.D., Professor  
"Blister Rust Fungus and the Five Needle Pines"



Diana Tomback is a Professor in the Department of Integrative Biology at the University of Colorado Denver. She teaches classes in Ecology, Evolution, and

Conservation Biology. Her research interests include the seed dispersal and ecology of five needle pines, and the conservation and restoration of whitebark pine ecosystems. Five needle pine ecosystems, including Limber and Bristlecone Pines in Colorado, are threatened by blister rust, a basidiomycete with an extremely interesting life cycle that includes multiple hosts. Professor Tomback will speak to us about the ecology of white pines and blister rust fungus and the relation to the Clark's Nutcracker (*Nucifraga Columbiana*) as well as the effect of mountain pine beetles on five needle pine ecology.

From Professor Tomback's Web Page:  
"Information on whitebark pine ecology has become particularly valuable as a consequence of (Continued on page 2)

## Upcoming Events

- Oct. 12<sup>th</sup> CMS Annual general meeting and Election of Officers.
- Nov. 1<sup>st</sup> CMS Mushroom Dinner, see note this page.

Bring mushrooms for identification and display to any meeting.

All meetings are held the second Monday of each month from Mar. to Oct. at 7:30 PM unless otherwise announced. In 2009 the Colorado Mycological Society will be meeting in the Asbury Event Center at 3011 Vallejo Street in historic North Denver. The Asbury Event Center is in the old Asbury Methodist Church (built in 1890) complex which is today privately owned and no longer functioning as a church. There are several entrances into the facilities. The door to our meeting room is at the northeast corner of the building.

## Nominations of Officers for 2010

Election of New Officers will occur at our October 12<sup>th</sup> meeting. The following individuals have agreed to run for office yet nominations will be accepted from the floor at the Oct. meeting, the nominee must have agreed to be nominated. Please consider offering your talent to CMS.

Nominee	Office
President	Ed Lubow
President Elect	Open
Vice President	Open
Secretary	Karen Ryan
Treasurer	Open
Editor <i>SporesAfield</i>	Norm Birchler
Webmaster	Linnea Gillman
Member-at-Large	Marilyn Shaw

(*Speaker continued from page 1*)

major population declines in the northern Rocky Mountains of the U.S. and elsewhere throughout its range. These losses result from a combination of past fire exclusion policies and white pine blister rust (*Cronartium ribicola*), a fatal fungal disease introduced from Europe to the western United States early this century. Currently, the upsurge in mountain pine beetles (*Dendroctonus ponderosae*) poses an additional threat to whitebark pine." <http://thunder1.cudenver.edu/clas/biology/faculty/dTomback.html>

Out of concern for the future of whitebark pine, Professor Tomback and several of her colleagues started a 501 (c) (3) non-profit organization, the Whitebark Pine Ecosystem Foundation <http://www.whitebarkfound.org/> which is dedicated to restoration of whitebark pine ecosystems and educating the public about the ecological importance of whitebark pine. Professor Tomback has served as founding director of the WPEF since 2001.

## Please mark your calendars!!!

The 2009 CMS

End-of-Season Fungi Feast

is scheduled for Sunday, November 1<sup>ST</sup>.

This event fills up fast so contact Tom Ruzicka to make your reservations! You can contact Tom at 303-447-2740.

## *SporesAfield*

*SporesAfield* is published from March through October by the Colorado Mycological Society. CMS dues are \$28 for the first year and \$25 thereafter. Send membership dues to Linda deLeon, CMS Membership Chair, 14310 W. Fifth Ave. Golden, CO 80401-5226. All CMS members receive *SporesAfield* as part of their membership

CMS is an affiliated member of the North American Mycological Association.

CMS web site: [www.cmsweb.org](http://www.cmsweb.org)



## You Had to Be There

By Ellen Jacobson

We all awaited the arrival of the 2009 mushroom season with high anticipation of a great year prowling the meadows, woods, lawns, and cottonwood bottoms of Colorado. In late April after promising spring rains and my usually good intuition, I skipped off to my favorite morel grounds to be greeted by absolutely nothing. The soil was moist, the humidity high, the temperature perfect. Nothing. A week later, two very small morels, three days after that, nothing. So I changed venues and headed out to Waterton Canyon, where I found about an acre of Poison Ivy, but no morels. For me in 2009, they were just not meant to be. The city, on the other hand, produced more mushrooms than I have ever seen and I was quite happy eating my favorite, *Agaricus arvensis*.

Oh, such a good watery wet June. So much so that the State of Colorado declared that the reservoirs were full, the drought was over, and it was surely time to begin the construction of many new dams to hold all this aqueous bounty. We'll see said the skeptics and by now I was one of them. Round about June 25th, I headed for the mountains for just a peek at the *Boletus* patch and what to my wondering eyes did appear, but 17 lb. of perfect *Boletus edulis*. This was an unexpected treat and the area continued to produce for the next three weeks. In 35 years of mushroom hunting, I had never seen them this early.

Dark clouds of the wrong kind, however, appeared on the horizon. With little rain, low humidity, and unusual heat for the Front Range, few other mushrooms appeared. The reliable *Agaricus* poking from their deep beds of duff made for several tasty meals; there were a few *Chantarelles*, a fair number of *Russulas*, not many Hawk Wings, and almost no *Suillis*. There was something wrong with this picture. I traveled far from my normal path and found similar conditions. Reports from Breckenridge and Vail were dismal. Rain and very cold or no rain and very cold.

Some lucky souls had success on the Rampart Range Road, others near Wellington Lake, and a few more in the Pike's Peak Region; but for the most part, to be diplomatic, it was not an abundant season. The Fair rolled around and we wondered what we might have on the tables. On the day-before-the Fair Foray to Arapaho Springs, we actually found about 40 species, most were brown and small, but everyone enjoyed the day and several were new additions to the Colorado List.

The Buena Vista Festival was excellent as always, but many of our usual finds were among the missing. I wish I could say that the Vail and Shrine Pass were great, but once more the combination of late rain and early frost did us no favors.

The 2009 season challenged us all to pay very close attention to the weather. Not only rainfall, but also moisture, humidity, and temperature are of great importance for mushroom fruiting. Remember the words of Alexander Smith, the dean of wild mushroom hunters, "They grow where they grow." There is always next year.

## Upcoming Forays

**NAMA Foray 2009** in Lafayette, Louisiana, Nov. 26 to Nov. 29. The deadline for registration is Oct. 19, 2009. Information and a registration form are available on [namyco.org/events](http://namyco.org/events). You must be a member of NAMA or the Gulf States Mycological Society (GSMS) to attend. Inserted into this month's newsletter is the North American Mycological Associations membership application and more information about NAMA.

(*Presidents continued from page 1*)

As we are well aware this has led to essentially complete devastation of the Colorado Lodgepole Pine population.

Dutch Elm, *Ulmus minor* x *U. glaba*, Disease, *Ophiostoma ulmi*, *O. novo-ulmi*: The elms tress of Denver and Colorado Springs were killed off by a species of fungi related to that which has killed off our Lodgepole Pines. Dutch elm disease affects all species of elms. The American vector is the American elm bark beetle *Hylurgopinus rufipes*.

Black Walnut *Juglans nigra*, Thousand Cankers Disease, *Geosmithia* spp.: Currently the Denver Black Walnut population is threatened by another species of fungus, this carried by Black walnut twig beetle. Growth of the fungus within the leads to the formation of large cankers that girdle the branches and disrupt the flow of water and nutrients in the plant's vascular system. *Geosmithia* spp. are carried by many species of beetles and can infect many species of trees. (See for example the article in Mycological Research, June 10, 2007, Host range and diversity of the genus *Geosmithia* (Ascomycota: Hypocreales) living in association with bark beetles in the Mediterranean area, by Miroslav Kolarik, Martin Kostovcık, Sylvie Pazoutová.)

American Chestnut, *Castanea dentate*, Chestnut Blight Fungus, *Cryphonectria parasitica*: The fungus was introduced into North America during the early 1900's on lumber or imported trees. By 1940 a population estimated to be near 4 billion trees was wiped out (American Chestnut Foundation).

Sudden Oak Death, *Pytophthora ramorum*: Once classified as a fungal disease, this devastating disease is caused by an Oomycete (water mold), Kingdom Chromalveolata. This particular *Pytophthora* infects over 60 genera of plants. *Pytophthora infestans* was the causative agent of the potato blight of the Great Irish Famine in the mid 1800's.

Largest Organism on Earth a Tree Killer. *Armillaria ostoyae* (once classified as *A. mellea*): Finally, it would not be right not to mention that the Honey Mushroom, considered by many to be the largest organism on earth, is a parasitic, pathogenic, edible mushroom. It attacks a number of commercial hardwoods, including Douglas-fir *Pseudotsuga menziesii* and Western Hemlock *Tsuga heterophylla*. Infection of forests by this mushroom has been used as a justification for clear-cutting logging practices.

Addendum to last month's Mushroom Toxins Column:

We need to add to the References list: Mushrooms Poisons and Panaceas by Denis Benjamin, W. H. Freeman & Co., 1995.

Professor Joe Ammirati of the University of Washington has made the suggestion that we "include the Smithania Syndrome as a major poisoning category since it is so dangerous".

Here's information on the additional toxin class for the Oct. Spores: (Thank you, Marilyn and Joe!)

Allenic norleucine. Found in *Amanita smithiana*, and a few other *Amanita* species, including *A. abrupta*, *A. proxima* (Europe), and *A. pseudoporphyria* (Asia). These poisonings have been confused with orellanine poisonings because the primary organs affected are the kidneys. However, the onset time is much shorter (5-14 hours) than in orellanine poisonings (36 hours to 14 days). First symptoms are gastrointestinal: nausea, vomiting, diarrhea, abdominal pain, followed 2-3 days later by symptoms of renal failure, which can be severe. This is an especially dangerous type of poisoning because this large attractive white mushroom can be mistaken for the widely sought after *Tricholoma magnivelare*, the Japanese pine mushroom, Matsutake. Both are common in the Pacific Northwest.

Note: CMS October General Election will be held AFTER our speaker's presentation.



## Official 2008 Colorado Mycoblitz Campsite Copy of FUNGI Magazine

David Wallis

New Mexico Mycological Society

Mushroom enthusiasts may choose from a variety of mushroom magazines. Some cater to the science-minded, some to the novice. Some combine a nice blend. Some magazines have been around a long time, some are new. Some are published and delivered promptly on schedule, some keep a person guessing.

But what is the real measure of a mushroom publication? Should it have lots of color photos? Should the articles be well written as well as diverse? Should the magazine appeal to a wide range of readers—from amateur mushroomers to professional mycologists? These are certainly factors to consider, but the true test of a mushroom magazine is how well it survives when left out in the rain.

Last year, in 2008, members of the Colorado Mycological Society held their first Mycoblitz in Rocky Mountain National Park. To support that event, Britt Bunyard, Editor of the magazine FUNGI, sent complimentary copies of his publication for field testing. A few of these copies ended up in folks' cars, probably to travel back home to be read later. Others stayed in the identification area to be passed around or to languish quietly on a table. One copy, however, we put to the test. It endured all the campsite tasks one would expect of fine reading material.

FUNGI: Volume 1 No. 2: Summer 2008. You can still read this information on the front cover, even though our campsite copy served as a cutting board, pot holder, place mat, handy surface for impromptu spore prints. It also served to sop up occasional spills of wine, tequila, and the Mycoblitz favorite: Mojitos. Then came the real test. FUNGI Volume 1 Number 2 lay uncomplainingly in the rain for a dozen or more showers while we drove around Rocky Mountain National Park searching for--fungi.

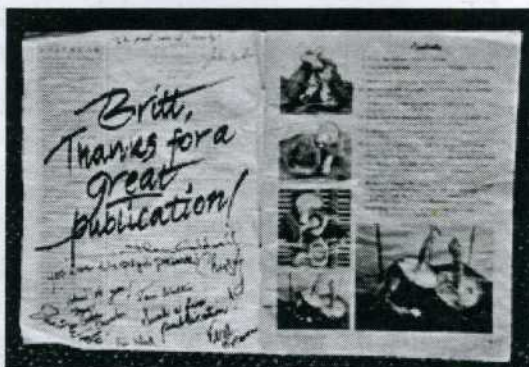
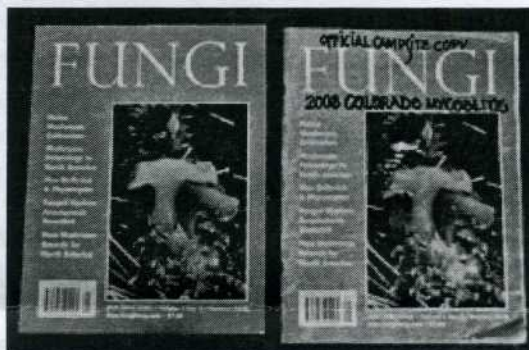
The last folks to leave the campsite (the small contingent from New Mexico) took pity on the poor vegetable-stained, spore-printed, waterlogged magazine, and decided to take it home. We thought, however, that it should ultimately return to its origin, to its creator Britt Bunyard. A year later, during the 2009 NMMS Foray in Taos, NM, Rob Hallock, last year's CMS President and Mycoblitz organizer, returned to Britt Bunyard the Official 2008 Colorado Mycoblitz Campsite Copy of FUNGI Magazine.

Britt gratefully accepted the 2008 Campsite Copy and provided a new copy for this year's Mycoblitz: Volume 2 No.2 2009. We're certain that it, too, will stand the test.

Related Links

FUNGI magazine: [www.fungimag.com](http://www.fungimag.com).

Colorado Mycological Society: [www.cmsweb.org](http://www.cmsweb.org)





# Why cats crave mushrooms

Sue Kinnamon & Tom Finger  
Rocky Mountain Taste & Smell Center  
Univ. Colorado Denver  
Aurora, CO

In the August issue of Spores Afield Ellen Jacobson noted that her cat “begged for boletes” and wondered whether this was a common occurrence and if so, why. Although we have only dogs – and we can’t even train them to find boletes in the forest – we can offer a reason why cats may like mushrooms.

Our desire for various foods, like that of other animals, is driven largely by our sense of taste. Taste sensations fall into two broad categories: those that drive increased intake (so-called appetitive qualities) and those that are naturally avoided, e.g. bitter. For humans, as for most other mammals, innate food preference is driven by nutritional requirements. Unripe fruit and plants containing toxins are bad; carbohydrates and protein are good. For herbivores, sodium salts are a strong nutritional need as well. Hence we have developed the ability to discriminate 5 taste qualities. The aversive taste are: Sour (for avoiding unripe fruit and spoiled foods) and bitter (for avoiding toxic alkaloids produced by many leafy plants). Salt, which is a strong intake motivator for herbivores, is preferred by people only in moderate quantities (and becomes avoided at very high levels). Finally, the preferred qualities for humans are sweet (to identify foods rich in carbohydrates) and “umami” (Japanese for “delicious”) for detection of protein-rich foods. Dogs have similar taste preferences, but cats do not. Why?

The taste receptors for the preferred qualities of sweet and umami consist of two component molecules. For sweet, the receptor complex consists of the sweet-specific molecule T1R2 and an obligatory partner T1R3. For umami, the receptor complex is the umami-specific receptor T1R1 and the common partner T1R3. Scientists at Monell Chemical Senses Center in Philadelphia, PA discovered that domestic cats and all other felines have a mutation in the T1R2 gene which produces a dysfunctional sweet receptor. So felines cannot taste sweet and do not perceive it as a pleasurable stimulus. Cats do however, have a strong sense of taste for umami since those receptors are not mutated.

So why should mushrooms stimulate a receptor which mostly detects proteinaceous compounds? Understanding this requires a little food chemistry. Proteins are composed of amino acids, the most abundant of which is glutamate. The umami receptor is highly tuned to glutamate although it may respond to some other amino acids. But the response to glutamate is much

stronger if the stimulus also contains nucleotides such as guanosine and inosine, which are components of nucleic acids found in all living tissues. You will note that many foods in the supermarket contain added disodium guanylate and disodium inosinate as flavor components because they enhance the flavor of umami, which is a preferred flavor for all people. Mushrooms have high levels of nucleotides as well as reasonably high levels of glutamate and therefore have a strong umami flavor. Hence both humans  
*(Continued on page 9)*

**Taste Receptor Genes in Mammals**

	T1R1	T1R2	T1R3	Sweet receptor (T1R2+T1R3)	Umami Receptor (T1R1+T1R3)
Humans	+	+	+	+	+
Dogs	+	+	+	+	+
Cats	+	0	+	0	+

*Unlike most other mammals including people and dogs, cats lack a sweet receptor. In the feline lineage, there has been a mutation of one component of the sweet receptor gene complex rendering the receptor inactive.*

(Cats continued from page 8)

and cats like mushrooms. Fish also contain high levels of glutamate and nucleotides and are used widely in cat foods. But whereas people like sugar, cats can't taste it. Other foods rich in glutamate and nucleotides include: cheese, especially aged hard cheeses such as Parmesan and Romano, tomatoes (esp. sun-dried ones), and nori (Japanese seaweed). Note also that cantaloupe and green beans, also preferred by Ellen Jacobson's cat, contain high levels of glutamate.

### Foods Rich In Umami Flavor

	Nucleotides mg/100g	Glutamate mg/100g
Beef	107	107
Ham	122	337
Green Beans	n.d.	194
Cantaloupe	n.d.	209
Tomatoes	0	246
Sardine	193	280
Parmesean Cheese	n.d.	1200
Nori		
Seaweed	9	1378
Shitake		
Mushroom	150	71

n.d. = not determined

### Non-Umami Foods

	Glutamate mg/100g
Apple	25
Beets	24
Carrots	16

Data from the Umami Information Center  
[http://www.umamiinfo.com/umami-rich\\_food/](http://www.umamiinfo.com/umami-rich_food/)

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The editor of *SporesAfield* needs your help. Please consider submitting an article, line drawing, digital photographs, a poem, editorial, comic, report on mushroom sightings, news items, announcements of upcoming events, or any other contributions to your newsletter. This is your chance to share with your fellow members. Send items by the 15<sup>th</sup> of each month March through September to:

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