Mycena News

The Mycological Society of San Francisco January, 2012, vol. 63:05

January 17th MSSF General Meeting

Crazy About Mushrooms

What do the poisoned Emperor Claudius, the Aztec storm deity Quetzalcoatl and a 5,500 year-old Ice Man have in common? They were all crazy about mushrooms!

BUT WHY!? "Crazy About Mushrooms" is a dynamic, multimedia presentation that brings the story of the mysterious mushroom to light.

Anna McHugh is an award-winning journalist, writer and mycophile from Nevada City, CA. In the fall of 2010, Anna produced a public radio documentary about mushrooming where she uncovered the most prestigious, quirky, and dedicated mushroom nuts in America and recorded their stories. Using recordings and images, Anna illustrates how a passion for mushrooms transforms our relationship to the planet.

MycoDigest: "Hotlips" on the Beech

By Andrew Wilson

Figure 1: *Calostoma sarasinii* from the highlands of Malaysia. This species is found to grow ectomycorrhizal with *Castinopsis (Fagaceae)*.
(Courtesy Dennis Desjardin)

Not many people from the west coast are familiar with the enigmatic puffball genus Calostoma and why it comes by the deserved nickname "hotlips". This is because it only occurs on the east coast. Why? This is a question I have been interested in for a while and will discuss soon. First, a proper introduction is necessary.

The name Calostoma is Greek for 'pretty mouth' and one look at this fungus and you will understand why (Figure 1). The spores from this puffball are released through a pore at its apex, a similar placement to that of earthstars (Geastrum) or the stalked puffball (Tulostoma). However in Calostoma this opening is called a peristome – similarly derived from the world stoma for mouth – where the opening is rimmed with a raised ridge ("lips"). What sets off Calostoma from other puffballs is that its peristome is normally colored bright red or orange. Because of this, the nickname "hotlips" is clearly appropriate and its striking appearance is hard to forget.

If you have been fortunate enough to observe Calostoma species in the flesh, you might have experienced a mixture of fascination and repulsion. In the case of *C. cinnabarinum*, the fruiting body is regularly encased in a thick jelly that the fungus sheds when it is ready to release its spores. In addition, the fruiting bodies

Continued on page 4

MycoDigest is dedicated to the scientific review of mycological information.

Fungus Fair Thanks!

Once again, thanks to our many excellent volunteers, the 42nd annual MSSF Fungus Fair was a great success. We had over 200 volunteers for the weekend and you all deserve thanks, even if I do not list your name here. We depend upon you immensely. Look for an invitation to the Volunteer Appreciation Party later in the spring. We ended up with c.2,000 paid attendees. Many thanks to Angela Mele for our poster art and to Lou Prestia for designing our T-shirts and having them printed in a limited time. Special thanks goes to Alice Sunshine for spearheading our efforts to get the word out in the media – we had a nice article in the Chronicle and a blog post in the Bay Guardian. Norm Andresen ably coordinated forays while Bill Freedman, Fred Stevens, Mark Lockaby, Chris Schoenstein, Mino de Angelis, Dan Nicholson and Wade Leschyn led them. We are perennially grateful to Jim Miller, our duff czar, for bringing in bags of oak leaves and pine needles.

Dennis Desjardin, Mike Wood, Fred Stevens, Tom Bruns, Else Vellinga, Dimitar Bojantchev, Norm Andresen, Tom Volk and many others helped with the sorting and identification process. Too many volunteers to name here staffed specimen tables and worked the identification table throughout the weekend.

Tremendous thanks go to Al Carvajal and his culinary team including Dulcie Heiman, George and Jane Collier. We are indebted to David Eichorn for organizing the soup sales and to those of you who made the many delicious soups especially since this is our biggest money-maker – thank you all! David E. also arranged the chef demonstrations and we thank David Campbell, Kevin Sadlier and Todd Spanier for entertaining the public with their expertise. In addition Dorothy Beebee's dyeing demonstration was a big hit.

Thanks to everyone who helped with the Book, T-shirt and Gourmet Table sales headed by Kevin Sadlier and Lisa Gorman respectively. Our esteemed Treasurer, Henry Shaw also deserves special thanks. George Willis' expert coordination of all the vendors for the fair made everything function smoothly while the vendors themselves provided excellent mushroom related items for sale.

We are grateful to everyone who helped with the Membership/Information table signing up new and renewing members.

We had an excellent suite of speakers: Tom Volk, David Campbell, Curt Haney, Else Vellinga, Ken Litchfield, Daniel Nicholson and J.R. Blair.

Many thanks go to Ginny Garrett and her helpers for building and staffing the woodland display, a keystone of our event. Ginny also was instrumental in setting up the mini-woodland display in the cafeteria a week before the Fair.

Special thanks to all of the specialty tables and all the folks who made them such popular rivals to all the other wonderful attractions at the fair. At Beginning ID Paul Koski, Brennan Wenck and Paul Nagano provided an excellent introduction to the world of mushrooms. Toxicology, Ecology and Culinary tables were expertly organized and staffed by Jane Wardzinska, Chris Thayer and Bill and Carol Hellums respectively. Thanks to the members of the California Lichen Society, Sonoma Mycological Association and Radical Mycology members for their informative and interactive tables. Alan Rockefeller at the Psychoactive table provided a reliable and authoritative presentation on a popular topic. Thanks for the delectable Edibles table go to Sam Longmire and his volunteers and to Mo-Mei Chen and her helpers for her wonderful display of Medicinal Mushrooms. And for an excellent display on Cultivation and for setting up and selling mushroom kits thanks go to Ken Litchfield and his acolytes from Merritt College and beyond. Perhaps the most popular place in the Fair was the Family Center. Karen Rusiniak along with Don Hughes and Annie Blair did a fantastic job putting together fun and interesting projects for the many kids that came to the Hall for the weekend. Thank you to those of you who helped break down the Fair, particularly Brennan Wenck, Paul Nagamo and Mino Angelis who stuck around to the bitter end: Shame on the rest of you! Speaking of Mino, I am very grateful for the use of his truck to move the heavy stuff from the storage unit and back. Thanks also to Dave Sozzani and Brennan for help with that. Very special thanks go to the hard working Lawrence Hall of Science staff, without whom the Fair would be a diamond in the rough, particularly Emma Duran-Forbes and Sue Guevara, as well as everyone else who helped out or simply tolerated us. Finally, I want to express my deepest thanks to two people without whom I could not have done this: Stephanie Wright for being the best volunteer coordinator one could hope for and for prodding me when I most needed it; and to Annie Blair, for being there.

Happy New Mushroom Year!
J.R. Blair

January Dinner: 1/9/12 -- Theme: Japanese New Year

Matsutake soup

Age sushi

Cucumber namasu

Shiitake cooked in soy and sake sauce

Spinach with tofu sauce

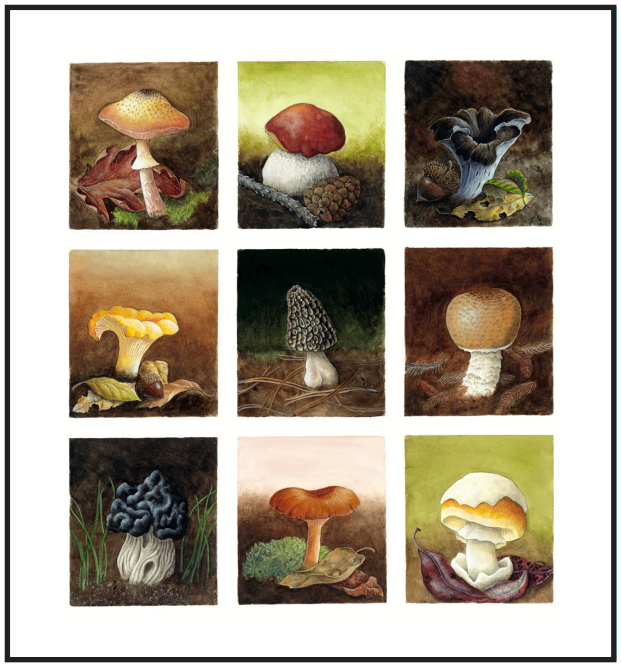
Teriyaki chicken

Tuna sashimi

Shrimp with long whiskers

Red kanten with crushed pineapple

A light dinner to help us recover from holiday overindulgences. Attendance limited to 60, reservations before Jan. 4. Bring your own linens, dishes, utensils, glassware, beverage and an appetizer to share. $16/person ($15 for seniors and students) payable online or at the dinner.



Secrets of the Forest: Portraits of Wild Mushrooms
Paintings in Gouache and Watercolor by Lucy Martin
January 4 - April 28, 2012
Wednesday - Sunday 10 AM - 4 PM

Helen Crocker Russell Library of Horticulture
San Francisco Botanical Garden at Strybing Arboretum
Golden Gate Park
1199 Ninth Ave., San Francisco, CA 94122

http://www.sfbotanicalgarden.org

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are composed of this rubbery, gelatinous tissue that is reminiscent of surgical tubing. The structure of Calostoma fruit bodies is unlike other puffballs. If you were to slice one of these in half, you would see that the spores mature inside a papery sack that is attached to the underside of the peristome (See *C. lutescens* in Figure 2). How this structure functions has not been described, but from personal observation of young and old specimens, it appears that when the spores mature this sack gradually shrinks, forcing the powdery spores out through the peristome. In essence, Calostoma is a bizarre fungus, even for a puffball, which only adds to my curiosity about its evolutionary history.

sociations. Part of my early dissertation sought to describe the ecological role of *Calostoma cinnabarinum* in Massachusetts. In this study I discovered that this species is ectomycorrhizal with Quercus (oaks).[1] In broadening this study to Asian species, I found *C. sarasinii* ectomycorrhizae on the root tips of Castinopsis in Malaysia (Figure 1). Both Quercus and Castinopsis are members of the beech family, the Fagaceae. This coincidence sparked my curiosity. After further research into Calostoma and the Fagaceae I began to see a pattern that might explain Calostoma's biogeographic history. This hypothesis suggests that the genus Calostoma originated in Southeast Asia where, as an ecto-

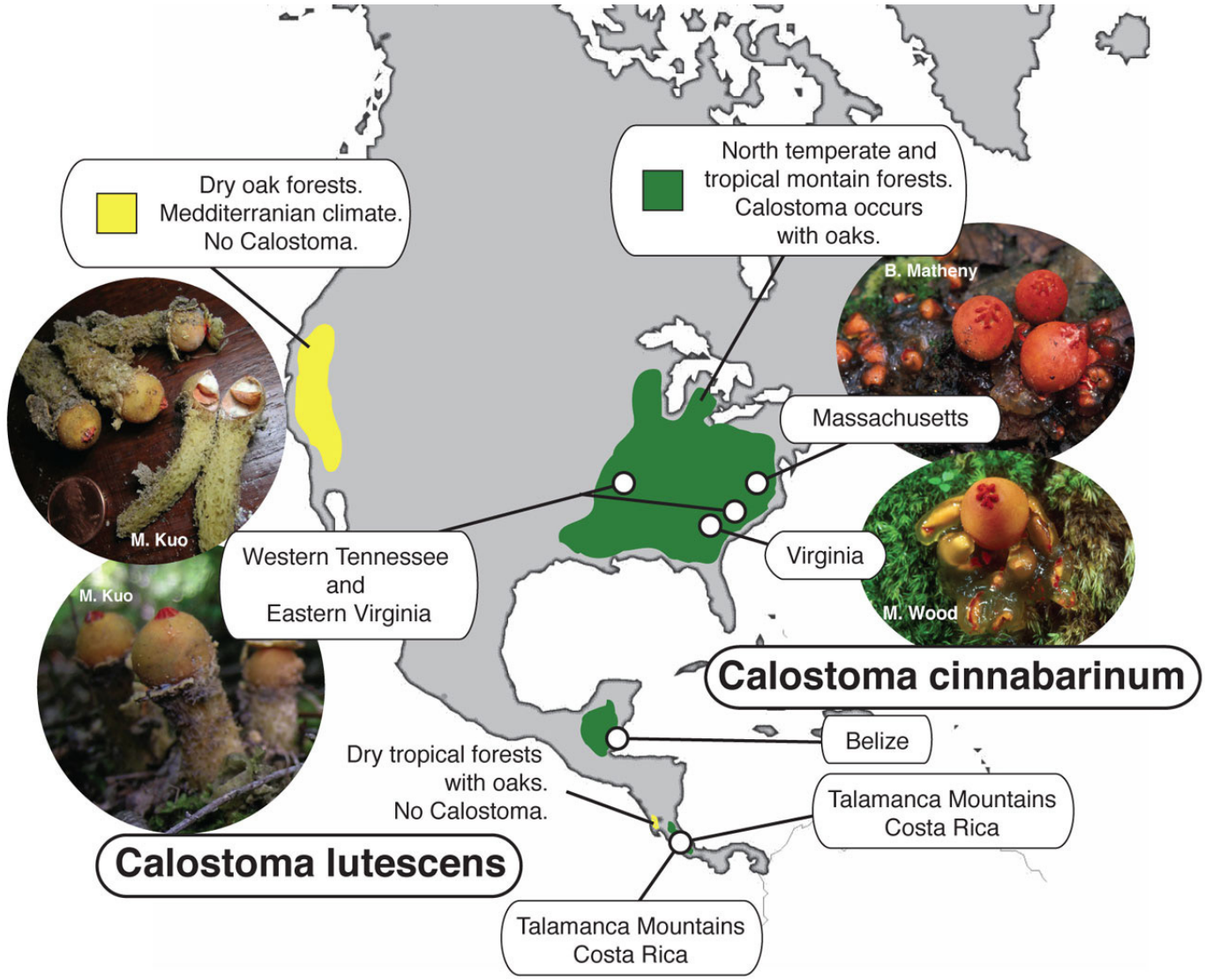

Figure 2: Calostoma distribution, North and Central America (Photos, top to bottom, left to right: Michael Kuo, Michael Kuo, Brandon Metheny, Michael Wood)

As a mycologist, I find it interesting that Calostoma grows on the east coast but not the west because it begs the question of why its distribution is limited in North America (Figure 2). Over the past several years I have been developing a hypothesis about the biogeography and evolution of this genus. This hypothesis was developed after learning about Calostoma's ectomycorrhizal as-

mycorrhizal fungus, it associated with members of the Fagaceae. This association began millions of years ago, and resulted a long-term, and exclusive (for Calostoma), love affair (so to speak).

The Southeast Asian origin of Calostoma is suggested through some unpublished research and the observation that this region happens to be the center of diversity for the genus. Southeast

Asia also happens to be where the Fagaceae originated as described in a study by Manos and Stanford.[2] According to this study, members of the Fagaceae, such as oaks and beech (Fagus), dispersed from their tropical Southeast Asian origins through Asia, across the Bering land bridge connecting Siberia and Alaska, and into North America. In the Northern Hemisphere, the only demonstrated ectomycorrhizal associations for Calostoma are with the Fagaceae. If Calostoma's ectomycorrhizal association with the Fagaceae is exclusive, then this relationship is what is likely responsible for Calostoma's existence in the New World.

As for where Calostoma species are found in the New World, *C. cinnabarinum*, is observed in the mixed forests of Tennessee, the Great Smoky Mountains and should be found in other North American forests with oaks. It has been collected in the Central America country of Belize and as far south as the montane oak forests of Costa Rica. Another species, *C. lutescens*, has this same distribution. These observations/collections have all occurred around some species of oak, supporting the hypothesis. The one problem is that Calostoma does not appear everywhere there are oaks. In the lowland dry tropical forests of Costa Rica, there are oaks, but no collections of Calostoma (Figure 2). A student of mine is currently describing the ectomycorrhizal communities associated with the oaks in these Costa Rican forests using molecular DNA analysis. I am curious to know whether any Calostoma is found growing on these root tips. However similar studies of oak woodlands in California did not identify any Calostoma ectomycorrhizae[3, 4] so there is reason to believe that the oaks in the dry tropical forests of Costa Rica do not have Calostoma. If not, then this suggests that habitat type (dry vs wet) is another factor limiting Calostoma's distribution to the wetter, mixed deciduous forests of eastern North America and Central America.

Ultimately, further evidence demonstrating the influence of habitat type and ectomycorrhizal associations of Calostoma needs to be gathered. As yet, it appears that species of Calostoma do not share the same promiscuous ability as its cousins Pisolithus and Scleroderma in forming ectomycorrhizal associations with many plant hosts. Evidence demonstrating that Calostoma grows on pine or some host outside of the Fagaceae will force me to revise this hypothesis. Until then, the evidence corroborating the shared histories between the Fagaceae and Calostoma I believe makes a fairly compelling story.

About the Author:

Andrew Wilson is a postdoctoral research associate at the Chicago Botanic Garden where he is studying the systematics and population ecology of the mushroom genus Laccaria. He was first introduced to mycology by Dr. Dennis Desjardin at San Francisco State University as an undergraduate. He soon committed to becoming one of Dr. Desjardin's Masters students to study the mushrooms of Indonesia. For his Ph.D. Andrew studied under Dr. David Hibbett at Clark University in Worcester, Massachusetts. It was there where Andrew began his studies on the ecology, systematics and evolution of genus Calostoma and the suborder Sclerodermatineae. Since then, he has made several collecting trips to Malaysia and one most recently to Tibet for his postdoctoral research. He is now collaborating with his postdoctoral advisor, Dr. Greg Mueller, on a proposal that will use new sequencing technology to study the population genetics of mushroom-forming fungi.

References

1. Wilson, A.W., E.A. Hobbie, and D.S. Hibbett. (2007). The ectomycorrhizal status of Calostoma cinnabarinum determined using isotopic, molecular, and morphological methods. Canadian Journal of Botany. 85: p. 385-393.
2. Manos, P.S. and A.M. Stanford. (2001). The Historical Biogeography of Fagaceae: Tracking the Tertiary History of Temperate and Subtropical Forests of the Northern Hemisphere. International Journal of Plant Sciences. 162(s6): p. S77-S93.
3. Morris, M.H., et al. (2008). Contrasting ectomycorrhizal fungal communities on the roots of co-occurring oaks (Quercus spp.) in a California woodland. New Phytologist. 178(1): p. 167-176.
4. Smith, M.E., G.W. Douhan, and D.M. Rizzo. (2007). Ectomycorrhizal community structure in a xeric Quercus woodland based on rDNA sequence analysis of sporocarps and pooled roots. New Phytologist. 174(4): p. 847-863.

Annual Mills Canyon Introductory Foray
Led by: J.R. Blair

January 14, 2012

Time to hit the phone for a clear introduction to the world of local mushrooms. We meet at the Adeline Drive entrance at 10:00 A.M.. Heavy rain cancels. Wear durable shoes, the 1-1/2 mile trail with little elevation could be wet. We usually finish about 12:30P.M

For reservations please call or Bill Freedman @650-344-7774 or JR Blair @650-728-9405

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MSSF Calendar January 2012

January 8th:	SF Beginner's Foray
January 8th:	Pt Reyes ID Class
January 9th:	January Culinary Dinner
January 10th:	January Council Meeting
January 12th:	SNFS Tak: What is a Mushroom Anyway?
January 17th:	MSSF General Meeting
January 21st-22nd:	Pt Reyes Mushroom Camp
February 13th:	February Council Meeting

Special Events

SOMA Wild Mushroom Camp January 14-16 2012

The 15th annual SOMA Wild Mushroom Camp will be held near Occidental, in Sonoma County. The public is invited. Special guests will be confirmed soon, main speaker is Andrew Weil, M.D. For more information check the SOMA site.

2012 MushRoaming Tours

Bolivian Amazon with Larry Evans: Jan 20 to Feb. 2
Tibet Cordyceps Expedition May 28 to June 10
Tibet Summer Fungal & Floral Foray July 17 to 30
For more details please check www.MushRoaming.com

Check the MSSF online calendar at:
http://www.mssf.org/calendar/index.php
for full details, latest updates and schedule changes.

The submission deadline for the February, 2012 issue of Mycena News is January 15th.
Please send your articles, calendar items, and other information to: mycenanews@mssf.org