
Mycena News



The Mycological Society of San Francisco October, 2011, vol. 63:02

October 18th MSSF
Meeting Speakers



Hawk and Venus

Amanita: Ancient Soma of the Vedas

Hawk and Venus, Vedic scholars and Shamans, will present historical evidence proving why *Amanita* is ancient Soma of the Vedas and speak about their shamanic use of the mushroom together since 1979. They will also read excerpts from their two books, show scenes from their documentary and discuss why *Amanita* is as helpful to mankind today as it was thousands of years ago for its many benefits.

With over twenty three years of Vedic scholarship, and over three decades of hands-on experience using *Amanita* as their daily sacrament and medicinal tonic, the couple share a unique understanding that they will share in the meeting.

MycoDigest: Amateur mycology and the dwindling taxonomists problem

By Todd Osmundson



Botanical - Educational plate - Edible fungi
Courtesy Vintage Printables

My electronic social circle has been abuzz recently about [an article in the Wall Street Journal](#) entitled “[The Fungus Among Us Multiplies As Mycological Taxonomists Wither \[1\]](#).” Granted, one discussion was mostly about the need for some new mycological puns, but mycological colleagues both amateur and professional have taken note that the mycological “taxonomy gap” is being recognized in the mass media sphere.

The WSJ article – which includes interviews with mycologist Roy Watling and entomologist (and outspoken defender of taxonomy) Quentin Wheeler – decries the dwindling number of professional taxonomists amidst the growing threat that many species may go extinct before they have even been discovered. As encouraging as it is that a well-respected, wide-circulation, non-science-specialist news source is discussing this issue, they have unfortunately taken too narrow a scope in defining the cause of the problem. The WSJ article states that the number of taxonomists is dwindling primarily because would-be taxonomists are being lured away by fields perceived as more modern or fashionable, such as molecular biology. Though there is certainly an element of truth to this no-

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PRESIDENT'S POST

Greetings, MSSF'ers!

MSSF had a great September. Although the rains are not upon us yet we had reports from members in other parts of the state and from even further afield that species are being collected and identified this fall in several different regions. If you missed the general meeting on September 20, you missed a great talk by Connie Green about the commercial mushroom industry and some of her personal tales about travel, the challenges of the business, and interesting background about some of the things in her recently published book. From her presentation the diversity and range of several popular edible species was explored from a geographic perspective combined with Connie's expert knowledge of where different edibles grow and where they yield the best culinary quality.

We also conducted our first Culinary Group meeting in September. Make sure to read the Culinary Corner to the right of my column for more details on how the culinary group will be organized this year and how you can participate.

With this issue we are also announcing the details of our Mendocino Foray, scheduled for November 18 -20, that has been a club tradition for many years. This year MSSF is offering two fully paid foray scholarships available to educators committed to expanding their curriculum to include basic mycology. Please see details in this newsletter, on the Web site, or contact me directly for an application. Make sure to check the calendar or our mailing list for more information about two additional fall forays already announced by our foray chair at the September meeting. These smaller forays are always at no charge to MSSF members.

As is our tradition, the annual Fungus Fair will follow the Mendocino trip in early December. The Fungus Fair will again be held at the Lawrence Hall of science on December 4th and 5th. We will soon be registering much-needed volunteers for the Fair, keep an eye on the Web site for details.

We have some volunteer positions to fill including a Councilor to replace Thomas who is back in Micronesia studying. This is a full council position where you get to help shape the work of the Society. We also need several volunteers to help with scanning the MSSF archives which I would like to see us get digitized and online by the end of this season. I have had some interest in both roles from people at the general meeting but if you did not attend or did not come forward to volunteer there please don't hesitate to contact me if you'd like to get more involved.

Here's wishing you all a great October and hoping that the rains come along for us. I'll look forward to seeing you at the Culinary Group dinner on October 3 and the general meeting on October 17th.

Thanks as always for your support.

-Lou

president@mssf.org

CULINARY CORNER

A standing ovation for Culinary Group Organizer Emeritus, Pat George! We expect to see her at every dinner savoring the chance to sit down and quietly enjoy the fare.

On September 12, the MSSF Culinary Group launched the 2011-2012 season (September-May) with a pot luck feast that left most of us stuffed to our proverbial gills. Another standing ovation for all of you who prepared and shared.

The first organized dinner for the MSSF Culinary Group will be a Thai themed meal on Monday, October 3, 7 pm in the San Francisco County Fair Building (a.k.a. Hall of Flowers) in Golden Gate Park. Please see [the website calendar](#) for details. Carol Reed is the Captain for what promises to be an exquisite Thai-themed menu.

The tentative menu:

Punch

Thai Spinach Wraps

Tom Yum Kao Soup

Bun Bun Noodles with Spicy Peanut Sauce

Chicken Satay (rumors of a taste of abalone) with Peanut Sauce

Pumpkin Curry

Green Salad

Coconut-based dessert

Please contact Carol Reed (415) 333-8820 to volunteer. We need help setting up chairs and tables as well as with clean up.

MSSF Culinary Group dinners are limited to members and their guests (max. 60/event). Reservations can be made on the [MSSF web site event registration page](#) and are REQUIRED. The deadline to reserve space for the October 3rd meal is Friday September 30th. Culinary Group annual dues are \$10 and are due in January in conjunction with the MSSF general membership dues. Each dinner is \$16 per person, \$15 for seniors and students (special menus may require an extra fee) and may be paid when making reservations, or at the dinner by cash or check. Diners are required to bring their own table cloth, tableware and beverages (decaf coffee is served at each dinner). We encourage people to bring specimens for ID.

Starting with the 2012-2012 season, each meal will have a captain who organizes the menu and cooking crew. Everyone should volunteer for the dinners once per season. Setup and cleanup positions are available for those who cannot participate in meal preparation.

Bill and Carol Hellums have graciously stepped into the role of Culinary Group co-chairs for this year. Steering Committee members are Dave Bell, Treasurer; and Lisa Bacon, who will write the Culinary Corner for the Mycena News. Please contact the Hellums at 415-347-7444 or Lisa at 707-765-9085 if you have questions.

tion, I have personally seen enough evidence to the contrary to be unconvinced that this is the major cause of the decline. Several times over the past several years I have seen excellent taxonomic projects, including surveys of geographical regions that are terra incognita mycologically-speaking, or revisions of diverse taxonomic groups – proposed by some of the best-respected scientists in U.S. mycology – go unfunded through 2, 3, or more rounds of funding competition. I have also seen several Ph.D.s trained in mushroom taxonomy move into other fields due to the realities of the job market during that time. So, I'm convinced that, in terms of professional positions for mushroom taxonomists, the problem is more one of funding and giving prominence to the field rather than demand for its services.

Given these numbers, it is clear that alternative models of filling the “taxonomy gap” will be needed if we are to achieve a reasonably full accounting of present levels of fungal diversity before extinction claims its victims. One suggestion circulating in my cybersphere, as well as an activity undertaken and mentioned by Dr. Watling in the WSJ article, is to harness the numbers and talents of amateur mycologists to do the work currently done by the shrinking number of professional taxonomists. I should note that I here use the words “professional” and “amateur” to denote one who works in mycology as a primary employment and one who does not, respectively, rather than in the sense of relative levels of skill – indeed, as pointed out by Watling [2], many of the giants in the history of fungal taxonomy were amateurs in the economic, but certainly not in the capability, sense of the word. As currently practiced in the United States, however, professional and amateur mycology are often (but not always) accompanied by a difference in strategy and outlook. This difference in many ways mirrors the difference between the way that science is taught – up to, and including, the college level – and the way that it is practiced. The way that science is often taught is as a package of textbook “facts” that have to be learned or memorized in an uncritical fashion. The practice of science – posing questions and assessing their possible answers based on the strength of evidence – is so different from the classroom version as to almost constitute another activity altogether. The ability to learn and identify mushrooms based on existing knowledge (field guides and even technical literature) – a skill possessed in great abundance by a number of amateur mycologists – is akin to the learning of existing knowledge. Scientific mycology is, in contrast, focused on the generation of new knowledge. The former is a necessary prerequisite, rather than an adequate substitute, for the latter.

What does this activity of generating new knowledge entail? Three of the primary types of work undertaken by scientific mycological taxonomists are the description of new species, classification and the description of higher taxa, and documentation of biodiversity and geographical distributions.

The description of new species requires a detailed analysis of characters between a species of interest and those species that are suspected to be closely related. These characters can be macroscopic, microscopic, submicroscopic (requiring scanning or transmission electron microscopes), biochemical, physiological, ecological, and/or genetic. A specialist must have not only an eye for detail, but a good sense of the variability found within as well as between species (gained through examining numerous individuals), and a strong command of the technical literature on the relevant group(s) of fungi in order to avoid the mistakes of either applying an existing name to a distinct species or applying a new name superfluously. A well-conducted study of a single species can therefore take months to carry out and write; a study of a genus or larger group can take years or a lifetime. In Describing Species (recommended read-

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Mycena News is the members' newsletter of the Mycological Society of San Francisco, published monthly from October to September.

Please e-mail photos, comments, corrections, and correspondence to mycenanews@mssf.org.

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Past issues of *Mycena News* can be read online at www.mssf.org.

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ing for persons interested in doing taxonomic studies), Judith E. Winston [3] describes many of the activities undertaken by taxonomists. Drawing from this book as well as personal experience, I would recommend the following as a minimal to-do list for any amateur mycologist committed to carrying out serious taxonomic studies:

- Acquire the necessary material tools – specimen dryer (food dehydrator), macrochemical reagents, and a microscope. A color guide is also a highly recommended tool for standardizing the use of color names in descriptions.
- Learn procedures and technical terms for accurate field description of specimens, noting that important characters that must be observed are different for different groups (for example, the macrochemical field tests important for identifying boletes are different than those used for *Russula*, and *Inocybe* specimens should be examined to determine how much of the stipe, if any, is covered by pruinose hairs; the importance of this latter character also determines how specimens must be collected, since handling them by the stipe can obliterate evidence of pruinosity).
- Keep voucher specimens. As knowledge about a taxonomic group, as well as the availability of technological tools, increases, it is essential that other researchers can examine specimens from earlier studies.
- Become an expert on a group of interest, including knowing the organisms themselves – including the range in variation in traits found within a species – and the technical literature on that group.
- Learn the tools of taxonomy, including rules of nomenclature and synonymy, use of herbarium collections, literature searching, and writing taxonomic keys.

The description of species makes up just a part of what a professional taxonomist (or systematist) does, however. The description of, and placement of species in, higher taxa (genus, family, order, class, etc.) is also a critical part of the job, constituting the activity of classification. Systematists are in unity in the belief that the type of classification system with the highest information content is one that reflects genetic relatedness or, more accurately, patterns of evolutionary descent (a phylogenetic system). A rigorous classification is built through careful comparative analyses of multiple characters of the organisms, using the standardized methodologies of phylogenetic systematics. Given the goal of constructing a classification system that reflects patterns of genetic relatedness, the ability to analyze genetic information (DNA sequence data) directly is of great value, and is so widespread as to be considered indispensable to current systematics. However, while the study of DNA (genotypic) data can reveal patterns of genetic relatedness, the study of morphological and other phenotypic data reveals the patterns of distribution and origin of those traits that make the study of organisms and the conservation of biodiversity fascinating and worthwhile pur-

suits. Both genotypic and phenotypic data therefore play an important role in systematics (their use in mushroom classification is discussed in more detail in [4]), and the professional systematist is responsible for developing and refining classifications that reflect new (or newly collected) data.

The third activity undertaken by most professional taxonomists is the discovery and documentation of biodiversity and biogeography. This activity incorporates the techniques of both of the previous two, and involves specimen identification, description, classification, and the computational analysis of the patterns of geographical distribution of traits and organismal groups.

In the WSJ article, Dr. Watling is quoted as saying “I wouldn’t say there’s a shortage of mycological taxonomists in the U.K. There ain’t any.” While this statement does not take into account those taxonomists that use molecular as well as morphological data (of which there are a number in the U.K.), it does highlight the seriousness of the current decline in the numbers of professional mushroom specialists, a situation mirrored across most – if not all – taxonomic disciplines. Even in the best of times, professional taxonomists never were plentiful enough to cover all areas at all times. With their greater numbers and geographical representation, amateur mycologists have the potential to cover much more ground in the effort to document fungal biodiversity and discover species new to science. So, can the taxonomy gap be filled by amateur mycologists? Certainly to some degree and in some respects, especially in the task of describing species, documenting geographical distributions, and observing phenotypic traits; as in the history of fungal taxonomy, today we are fortunate to have a number of expert specialists that are not primarily employed in mycology. However, we shouldn’t let ourselves believe that the task is an easy one. It demands a commitment to serious scholarship, and requires focused effort, careful and purposeful collecting and observation, and the acquisition of a set of necessary technical skills. Above all, it must be noted that a commitment to identification and naming is not enough; serious taxonomic study must include the generation of new knowledge. It must also be acknowledged that the work of a professional systematist has many facets in addition to describing species; these facets – especially pertaining to the science of character analysis and species classification – require additional specialized knowledge and tools. In addition, current efforts to meet the challenges of the biodiversity crisis, including broad-scale data dissemination and facilitating rapid survey studies of the planet’s most biodiverse, tropical habitats, require both large-scale collaborations and institutional resources [5]. Therefore, the role of the professional taxonomist remains essential, and the decline in their ranks remains alarming.

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Reduced numbers of professional taxonomists on one hand, and the need for a high degree of specialized knowledge and training on the other, make collaboration between amateur and professional mycologists critical if we are to meet the goal of discovering Earth's fungal diversity. Among the roles of professional mycologists in such collaborations could be to improve access to literature and herbarium collections to serious amateur taxonomists; conduct phylogenetic analyses of phenotypic and molecular characters; generate scientifically and statistically rigorous study designs for field surveys, and teach proper field and laboratory techniques. Among the roles of amateur mycologists can be to acquire expertise in particular taxonomic groups, document diversity and species occurrence in a wide variety of geographic localities; and collect, provide field descriptions for, photograph, and voucher specimens. In the Bay Area we are fortunate to have both active professional and amateur mycology communities, making directly collaborative projects possible. I had the opportunity to participate last year in a one such field trip, and the synergy of the specimen processing and identification pipeline produced during this trip, as well as the camaraderie of the participants, offer proof that this collaborative model can work. Given the magnitude of the challenges that we face in addressing the crisis of declining biodiversity, and the critical role of taxonomy in discovering – and hopefully conserving – this biodiversity, amateurs and professionals should form an additional collaboration as well: joining together in advocating for increased public attention and funding for taxonomy and biodiversity research.

About the Author: Todd Osmundson, Ph.D. is a postdoctoral researcher in the Garbelotto (Forest Mycology and Pathology) laboratory at the University of California-Berkeley. His research interests are in the systematics, biodiversity, evolution, ecology and conservation of fungi, especially ectomycorrhizal, endophytic and plant-pathogenic species. Current research projects include surveys of fungal biodiversity on the French Polynesian island of Moorea and phylogenetic studies of burn morels.

References:

- [1] Naik G. The fungus among us multiplies as mycological taxonomists wither. Wall Street Journal, September 7, 2011. <http://online.wsj.com/article/SB10001424053111904716604576544373054363118.html>.
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- [4] Osmundson, TW. 2010. Phylogeny, natural selection and the state of mushroom classification. *McIlvainea* 19. <http://www.namycology.org/publications/mcilmvainea/v19/phylogeny.html>.
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Gary Lincoff: Courtesy of the Telluride Mushroom Festival

MSSF Mendocino Woodlands Foray November 18-20, 2011

Featuring Gary Lincoff, author of:
Audubon Society Field Guide to North American Mushrooms.

Deep in the Mendocino woods, MSSF members, fellow mushroom enthusiasts, friends and family, gather once again for our annual north coast fungal rite of autumn. This weekend-long mycological event includes guided forays, a variety of classes, cooking demos, workshops, presentations and activities, special programs for children and plenty of mushrooms!

On-site meals and lodging (Fri. night through Sun. lunch) are included in the basic \$190 per person member rate; \$135 for children aged 5-12 years (if accompanied by a paid adult). A reduced rate of \$135 per person (\$95 child) is available for those staying at off-site lodging. This foray is for MSSF members and their guests only – only members can sign up.

[Register online using this link](#) or find the link on the calendar for full schedule details and more information. For registration questions, email president@mssf.org

Alcoholic beverages are BYOB. It is very important that every camper bring a flashlight for after dark safety. A complete list of what to bring, and directions to the camp will be sent to registered attendees November 1.

MSSF Library is Open for Business!

The MSSF Library is now open to all members. You can access the library at Randall Museum from 7pm to 7:45pm before general meetings. Peruse the collection, check out books, scan them and even reserve them online. (Just go to the Members Only section and select the Library menu item). You can check books out for 1-2 months.

Mycological Society of San Francisco
c/o The Randall Museum
199 Museum Way
San Francisco, CA 94114

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MSSF Calendar October 2011

- October 3rd: Culinary Dinner
October 18th: General Meeting :Hawk & Venus
October 14-16th: Oakridge, OR. Foray
October 22nd: Lichen Rock Trip
November 7th: Culinary Dinner
November 15th: General Meeting
November 18^t-20th: Mendocino Trip

CORRECTION

In last month's issue of Mycena News we used an illustration from Dorothy Beebe without attribution. The editor regrets this omission. In the future we'll be sure to include a full attribution when her illustrations are used.

Special Event

David Arora's Thanksgiving Weekend Mushroom Workshop & Foray Nov. 25-27

Join David Arora for a fungus-filled weekend at his 22nd annual Mendocino mushroom gathering. Mushroom hunts, cooking, lecture, discussion, ID, etc. with David Arora and special guests. To register, see davidarora.com for details.

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 November, 2011 issue of Mycena News is Sunday, November 16th. Please send your articles, calendar items, and other information to: mycenanews@mssf.org