

Newsletter of the Mycological Society of America

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August 16–20, 2009

The Society for Invertebrate Pathology
42nd Annual Meeting
Canyons Resort, Park City, Utah

September 15, 2009

Deadline for submission to *Inoculum* 60(5)

September 20–25, 2009

X National Congress of Mycology of Mexico
Guadalajara, Jalisco, Mexico

October 26–30, 2009

Fungal Conservation: science, infrastructure
and politics
Whitby, North Yorkshire, UK

November 15–19, 2009

Asian Mycological Congress (AMC2009)
& XIth International Marine and Freshwater
Mycology Symposium (IMFMS)
National Museum of Natural Science,
Taichung, Taiwan

November 26–29, 2009

NAMA/GSMS Foray
Lafayette, LA

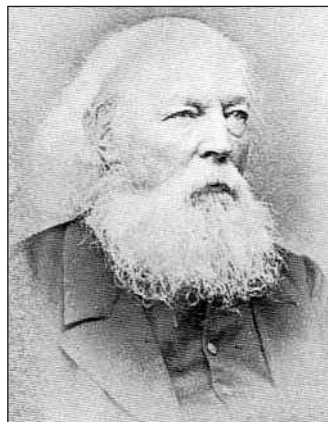
December 6–10, 2009

X International Fungal Biology Conference
Ensenada, Mexico

Editor — Jinx Campbell

Dept. of Coastal Sciences, Gulf Coast Research Lab
University of Southern Mississippi
703 East Beach Drive, Ocean Springs, MS 39564
Telephone: (228) 818-8878, Fax: (228) 872-4264
Email: jinx.campbell@usm.edu

Mycohistorybytes



**Miles Joseph Berkeley
(1803–1889)**

History tells us stories about where humans and societies have been and hopefully provides us with guidelines and wisdom that lead to sound judgment. Unfortunately, there is no guarantee that the facts of our past, even those of the “giants upon whose shoulders we stand”, will make their way into the knowledge base of one generation much less to the next. The question that then follows is how to go about fostering the educational process among ourselves and future generations. In this issue, *Inoculum* introduces **Mycohistorybytes**, the

purpose of which is to provide historical tidbits about scientists and mycological enterprises that constitute our colorful and important past. If you have any interesting **Mycohistorybytes** that you would like to share, please send them to the *Inoculum* Editor, Jinx Campbell. To begin, and appropriately so after nearly 150 years, let's explore the foundational words of Rev. M.J. Berkeley as taken from his *Outlines of British Fungology* published in 1860.

In Chapter 1, Berkeley basically describes two different camps of people. First are the many who kick the mushrooms aside (“objects of disgust”) or otherwise ignore them, and second are those few whose initial curiosity has made them “admire” their color, peculiar forms, and habits – both good and bad. Berkeley goes on to the say the following:

“ . . . but there is no general conception that the multitudes of parasites which grow on dead and living plants, frequently inducing disease or decay, the mould which runs over our fruit and provisions, or the yeast of beer and mother of vinegar, are closely allied productions; if, indeed, the very existence of some amongst them is recognized at all. We are obliged, therefore, to have recourse to the Latin language for a general word to comprehend the whole tribe, which is denominated *Fungi*. An objection, indeed, has been raised to the term Fungology, which indicates a knowledge of the whole tribe, as composed at the same time of a Greek and Latin word. The word is however like many other spurious words very generally received; and if the objection should be considered insuperable, we have but to substitute that of Mycology, which is at once correct in etymology and comprehensive enough to include all we wish. The

Continued on following page

word Fungus may however in any case be retained as expressing these plants in common parlance, only we must take care, if we do not use the more English-looking word Fungal, not to speak, as is too frequently the case, of a Fungi, which is at once grating to the ear, and utterly intolerable. If Fungus be considered as an English word, as it is used indeed by

some of our older authors, the plural will be Funguses; but there is then something unpleasing in the sound, and the term Fungi is certainly to be preferred.”

—Ed Setliff
dsetliff@twcny.rr.com

MSA BUSINESS

From the President's Corner . . .

Rainfall, at the right time and in sufficient quantity, is a field mycologist's dream come true; well it usually is for me anyway! In late May, near Brisbane, Queensland over 220 mm in a 12 hour period was recorded! While some flooding and beach erosion created some havoc, that rainfall brought a huge flush of macrofungi from the sands on Fraser Island. It was a completely different aspect than that seen in February including a plethora of *Cortinarius* and *Inocybe* in full swing. An entirely different set of Boletineae, *Amanita*, Hygrophoraceae, and fragile white-spored mushrooms were out as well. *Omphalotus nidiformis* might have won the prize for most biomass as it seemed to occur on nearly every dead log. A bolete with an apparent universal veil was a particularly outstanding find. True discovery begins with field work!

By the time this column is published, the annual meeting in Snowbird, UT will be finished. **Marc Cubeta** and his program committee (**Fred Spiegel**, **Tom Horton**, & **Andrew Miller**) have accomplished a daunting task in their superb effort at structuring this year's program for the annual meeting. That effort not only included organizing the typical oral paper sessions and posters, but also coordination with the BSA on combined symposia of mutual interest and finding time slots for all among the 900+ contributions at this meeting. The people at BSA (Bill Dahl & Johanne Stogran among others) have been extremely generous with their time and expertise to make sure this meeting is of mutual interest and benefit. **Brad Kropp** stayed on top of local issues at the meeting venue along with foray coordinators, **Don Johnston** and **Don Ruch**.



Roy Halling, President

I am extremely grateful to all members who have given of their time to society business; all is accomplished by the unselfishness of volunteers from our ranks. To those who have served on committees, those who continue to do so, and to those who agreed to new appointments, your efforts are appreciated and I thank you. I welcome the newest members elected to Council by the membership, and I appreciate the willingness of all who appeared on the annual ballot.

Society members should be pleased with the new and increased vigor of *Mycologia*. Former Editor-in-Chief, **Don Natvig** brought the journal back to timely publication; current Chief, **Jeff Stone** and Managing Editor, **Karen Snetselaar** are keeping it that way. The selection of cover artwork continues to illustrate the wide ranging subject matter

between the covers of each issue. Jeff and Karen have continued to make steady progress in implementing changes to streamline and improve the functioning of manuscript submission, review, and the entire editorial process in general. In addition, they have brought *Mycologia* further into the electronic realm with the Publication Ahead of Print feature. MSA Council, in the very near future, ought to give serious consideration to all electronic output of its flagship journal.

Mike Castellano has taken over as chair of the *Conservation* committee and is pursuing a higher level of visibility especially though the MSA's online presence. The only other committee to express such an interest has been from members of the *Biodiversity* committee. I do hope all specialist committees will make their presence and unique expertise known.

Continued on following page

Finally, I would like to acknowledge the dedicated folks on the MSA Council. Their input and perseverance keep the MSA alive and well with sage advice on all matters mycological. In particular, I am especially grateful to Cathie Aime, Secretary, and Sabine Huhndorf, Treasurer, for their help in the day-to-day maintenance of the society and in keeping me on track; they truly do make the difference. Thank you!

Again, please do not hesitate to email or call me with your ideas, suggestions, and concerns during the year. If at all possible, please support the products and services of our **Sustaining Members**. Thanks very much.

—Roy Halling
President



MSA Secretary's Email Express

There have been no formal MSA Council email polls since my last report.

New Members: It is my pleasure to extend a warm welcome to the following new (or returning) members. New memberships will be formally approved by the Society at the Annual Business Meeting at Snowbird, Utah in 2009.

- *Argentina:* Nilda Cerutti
- *Canada:* Toni June Atkinson, Luke Bainard
- *Denmark:* Lisa Munk
- *Japan:* Nitaro Maekawa
- *Puerto Rico:* Luis Alberto Ramirez Camejo
- *Thailand:* Kawinnat Buaruang, Tida De-thoup, Amnat Eamvijarn, Onuma Piasai, Siangjeaw PiriyaPrin
- *United States:* Kori Ault, Susan Brady, Russell M. Cossaboom, Willis Dehart, Michele Engel, Jonathan Patrick Hulvey, Carley Jane Kratz, Serenella Linares, Thomas Madsen, Mary W. Olsen, Garland Edward Pendergraph, Ted Raab

Emeritus candidates: There have been no applications for emeritus status since my last report. Emeritus status is conferred upon retired or retiring members who have at least 15 years good standing with the Society.

Deaths: I am saddened to report the recent death of **Robert J. Bandoni** on May 18, 2009. Dr. Bandoni was a long-time member of the MSA and emeritus member who will be missed by his many friends in the society.

REMINDER: MSA Directory Update: Is your information up-to-date in the MSA directory? The Society is relying



Cathie Aime

more and more on email to bring you the latest MSA news, awards announcements and other timely information, and our newsletter. To ensure that you receive Society blast emails and the *Inoculum* as soon as it comes out, and so that your colleagues can keep in touch, please check the accuracy of your email address and contact information in the online directory. This can be accessed via our web site at www.msafungi.org. If you need assistance with updating your membership information, or help with your membership log-in ID and password, please contact our Association Manager at Allen Press, the always-helpful Kay Rose at kröse@allenpress.com.

—Cathie Aime
MSA Secretary
maime@agcenter.lsu.edu

MSA Endowment Fund Contributions

The MSA gratefully acknowledges a generous contribution by an anonymous donor to the MSA Martin-Baker Research Fund: \$1000 in memory of Chester R. Benjamin, Lorene L. Kennedy, and Robert J. Bandoni, and \$2000 in memory of Gladys E. Baker.

—A. Elizabeth Arnold
arnold@ag.arizona.edu

MORE MSA 2009 ABSTRACTS

The MSA Abstracts for the 2009 meeting were published in *Inoculum* 60(3). However some authors inadvertently submitted their abstracts to BSA so those were not passed on to me for publication in *Inoculum*. Those missing abstracts are published here.

—Jinx Campbell
jinx.campbell@usm.edu
Editor

BRANCO, SARA

Serpentine soils do not limit ectomycorrhizal fungal diversity.

Extreme environments impose strong selective pressures and host poorly diverse and specialized communities. Serpentine soils are an extreme environment rich in Mg and heavy metals known to shape plant evolutionary histories. Here, I investigate ectomycorrhizal (ECM) fungal communities from Mediterranean monospecific *Quercus ilex* subsp. *balota* forests growing on serpentine and non-serpentine soil. I found very different but equally rich serpentine and non-serpentine fungal communities composed by a wide array of taxa. All major fungal lineages were detected on both forest types and there was no evidence for adaptive radiations associated with the serpentine habitat. These results indicate that serpentine soils do not limit ECM fungal diversity and might not constitute a physiological barrier for these fungi.

University of Chicago, Committee on Evolutionary Biology, 1025 E 57th St, Culver Hall 402, Chicago, IL, 60637, USA

BOYNTON, PRIMROSE J¹, PETERSON, CELESTE N², ELLISON, AARON³, FARLEY, KATHERINE B⁴, PRINGLE, ANNE¹.

Competitive outcomes between yeasts that inhabit carnivorous plant pitchers are limited by founding population size.

In reconsidering Baas Becking's "everything is everywhere" hypothesis, microbiologists have taken a keen interest in biogeography. Dispersal limitation and competitive outcomes can work together to influence microbial distributions. We used yeasts that inhabit leaves of *Sarracenia purpurea*, the purple pitcher plant, to investigate these two processes. We first isolated yeasts from pitcher plant water and identified them using sequences from the large ribosomal subunit; we found a variety of ascomycete and basidiomycete yeasts inhabiting these pitchers. Next, to investigate the impact of dispersal limitation on competitive outcome, we selected three phenotypically distinct isolates for competition in microcosms. Microcosms were inoculated with different relative numbers of cells to simulate different numbers of propagules that might land inside a *S. purpurea* pitcher. We predicted a clear competitive hierarchy that could be overcome by high dispersal. As expected, competitive ability in these three yeasts followed a transitive hierarchy. In addition, competitive ability improved with inoculum size in most cases. However, inoculum size showed little effect on the competitive ability of the competitive dominant. In this system dispersal and competition appear to interact, but the competitive dominant can overcome even relatively large competing founding populations. These results suggest that strong niche-based interactions are balanced with competitive-dispersal tradeoffs in the pitcher plant yeast system. Further work will examine tradeoffs between competitive and dispersal abilities in the field.

¹Harvard University, Department of Organismic and Evolutionary Biology, 16 Divinity Ave, Cambridge, MA, 02138, USA. ²Massachusetts Institute of Technology, Biology, 31 Ames St, Cambridge, MA, 02139, USA. ³Harvard University, Harvard Forest, Po Box 68, Petersham, Massachusetts, 01366, USA. ⁴Harvard University, 187 Dunster Mail Center, Cambridge, MA, 02138, USA

CUI, Y., MONEY, N.P.

Membrane and cytoskeletal dynamics during trap closure in the nematophagous fungus *Arthrobotrys dactyloides*.

Colonies of the nematode-trapping fungus *Arthrobotrys dactyloides* produces high densities of three-celled constricting rings within a few hours of close contact with nematodes. The closure of these traps is trig-

gered by nematode movement into the ring lumen, causing inflation of the motor cells to three times their untriggered volume within 100 milliseconds. Here we describe the use of confocal microscopy and transmission electron microscopy to study trap initiation and the capture mechanism. Trap closure involves the rapid reorganization of cell components and we show changes in membrane conformation and cytoskeletal distribution within the ring cells. In addition, we report a new method for inducing trap formation in liquid cultures of *A. dactyloides*. This method will be exceedingly useful for our ongoing investigation of trap development and function using molecular biological tools.

Miami University, Botany, 700 East High Street, 316 Pearson Hall, Oxford, OH, 45056, USA

DOUHAN, GREG W.¹, DE AL CERDA, KARLA¹, HUYNH, KARYN¹, GREER, CHRIS², WONG, FRANK¹.

Contrasting genetic structure between *Magnaporthe grisea* populations associated with the golf turf grasses *Lolium perenne* and *Pennisetum clandestinum* in California.

Gray Leaf Spot (GLS) disease of perennial ryegrass (*Lolium perenne*) and kikuyugrass (*Pennisetum clandestinum*) in golf courses in California was first noted in 2001 and 2003, respectively, and within five years has become well established. The causal agent of the disease is the fungus *Magnaporthe grisea*, which is known to consist primarily of clonal lineages that are highly host specific. Therefore, our objective was to investigate host specificity and population dynamics among isolates associated primarily from perennial ryegrass and kikuyugrass since the disease emerged at similar times and both grasses can be found on a single golf course. We also obtained isolates from additional hosts (Tall fescue, St Augustinegrass, Weeping lovegrass, and Rice) for comparative purposes. A total of 38 polymorphic AFLP makers were scored from 450 isolates which clustered by host with high bootstrap support (71 to 100%). Genetic structure between Kikuyugrass and perennial ryegrass isolates differed significantly. Isolates from kikuyugrass were genotypically diverse (n = 34), possessed both mating-types, and tests for random mating could not be rejected whereas isolates from perennial ryegrass were less genotypically diverse (n = 10) and only consisted of a single mating-type. Low genotypic diversity was also found among the other host specific isolates which also only consisted of a single mating-type. This is the first study to document evidence for the potential of sexual reproduction to occur in *M. grisea* isolates not associated with rice (*Oryza sativa*). Moreover, given the significant host specificity and contrasting genetic structures between turfgrass associated isolates, the recent emergence of GLS on various grass hosts in CA suggests that potential cultural practices or environmental changes have become conducive for the disease and that the primary inoculum may have already been present in the state.

¹University of California, Plant Pathology and Microbiology, Riverside, CA, 92521, USA

²UC Cooperative Extension, Colusa, CA, 95932, USA

KHIDIR, HANA², PORRAS-ALFARO, ANDREA¹, HERRERA, JOSE², EUDY, DOUGLAS², SINSABAUGH, ROBERT³, NATVIG, DONALD³.

Transcontinental patterns of root-associated fungal communities colonizing a dominant grass, *Bouteloua gracilis*.

Symbiotic associations among fungi and plants play a fundamental role in the evolution and establishment of plants within terrestrial ecosystems. Few studies, however, have undertaken a geographic assessment of microfungus communities that colonize roots of grassland plants. We studied the geographic distribution of root-associated fungal (RAF) communities at a transcontinental scale within a single host: *Bouteloua gracilis* (blue grama). This study was undertaken as part of a larger comprehensive inventory of grass-associated fungal communities at different scales: different plant organs, grass species, and ecosystems. We collected more than 3000 sequences from environmental samples using fungal-specific primers and microscopically assessed >150 individual roots from >60 plants from six sites across the latitudinal range of *B. gracilis*. The fungal load within roots was generally high but variable,

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and dominated by Dark Septate Endophytes (DSE). Furthermore, the composition of the fungal communities generally varied and was dominated by several closely related members of the Agaricales and Pleosporales. These taxonomic groups colonized roots at all study sites, but their abundances varied with latitude. Most other members of the RAF community were ephemeral or were observed inconsistently within a few plants. Nevertheless, fungal community similarity was strongly and negatively correlated with intersite distance.

¹The University of New Mexico, Biology, 167A Castetter Hall, Albuquerque, NM, 87131, USA. ²Truman State University, Biology, 100 E. Normal, Kirksville, MO, 63501, USA. ³The University of New Mexico, Biology, 167A Castetter Hall, Albuquerque, NM, 87131, USA.

LINARES, SERENELLA¹, MORRIS, VERNON², CHAVERRI, PRISCILA³.

Comparison of DNA Extraction Methods to Assess Fungal Diversity in Saharan Dust Storms.

Saharan dust storms are massive atmospheric phenomena capable of transporting 200–300 teragrams of dust across the Atlantic Ocean every year. Although these events have been implicated in transport of human and plant pathogens across continents, little is known about the biological components of these dust masses. Previous research has primarily focused on viable organisms that can be cultured in artificial media, leaving behind an unknown set of organisms that might be non-culturable or obligate biotrophs. This study aims to characterize the actual fungal diversity present in Saharan dust using molecular and morphological identification tools. Standard DNA extraction methods, including commercial kits, do not work well due to the high concentration of salts and minerals in the soil and the resistance of the fungal material present in the sample. Therefore, to more accurately assess fungal diversity using environmental PCR techniques, more effective methods to extract DNA from filters and soil had to be tested. Dust samples were collected on transatlantic voyages during dust storm events through the Trans-Atlantic Saharan Dust AEROSOL and Ocean Science Expedition (AEROSE) from 2004 to present. To test the DNA extraction methods, soil samples from 2004, 2006, 2007, and 2008 filters and soil were used. Several cell lyses and pretreatment methods were tested, including 3 chemical pretreatments (AINH₄(SO₄)₂, CaCO₃, CaCl₂) and 4 mechanical lyses methods: vortex, sonication, stirring with heat, and freezer mill pulverization. Two different mechanical lyses were the most effective methods to extract DNA from the samples: stirring with heat and freezer mill pulverization since they provide the flexibility of extracting DNA from both types of samples and it also provides high yields. The preliminary survey shows a high phylogenetic diversity of fungi using ITS and LSU nuclear ribosomal DNA sequences.

¹University of Maryland, Plant Sciences and Landscape Architecture, 2102 Plant Sciences building, University of Maryland, College Park, MD, 20742, USA. ²Howard University, Chemistry Department, 525 College Street, NW, Howard University, Washington, DC, 20059, USA. ³University of Maryland, Department of Plant Sciences and Landscape Architecture, 2112 Plant Sciences Building, University of Maryland, College Park, MD, 20742, USA.

SALGADO-SALAZAR, CATALINA¹, SAMUELS, GARY², CHAVERRI, PRISCILA³, ROSSMAN, AMY Y.⁴

Hypocrealean fungi from a tropical rainforest in Queensland, Australia.

During a weeklong Mycoblitz in the Atherton Tablelands of Queensland, Australia, many hypocrealean fungi were collected. Preliminary identifications indicate that many of these specimens are part of the pantropical hypocrealean biota. Some of the common tropical species collected include: *Bionectria subquaternata*, *Cosmospora vilior*, *Lanatonectria flavolanata*, *Nectria pseudotrichia*, *Neonectria jungneri*, and *Ophiotrichia trichospora*. A number of interesting species of *Neonectria* were collected including *N. pulcherimma*, *N. radicolata*, and *N. veuillotiana*. Some lesser known species were also discovered. The unusual *Hypomyces triseptatus* was collected; this species is known previously only from Africa and Asia suggesting that it may be a relict from the isolated forests. *Viridisporea alata* was collected for the first time outside of the American tropics. Members of *Haematonectria* having *Fusarium solani*-like asexual states from Queensland had previously been determined to belong to clade 2 from South America and Asia. Although many of these specimens appear to be the common pantropical

species, some data suggest that isolates of at least one species of *Nectria* from Australia-New Zealand represents a distinct lineage. Species of *Cosmospora*, *Nectria* and *Neonectria* will be investigated further.

¹University of Maryland, College Park, Department of Plant Sciences and Landscape Architecture, 2112 Plant Sciences Building, University of Maryland, College Park, Maryland, 20742, USA. ²United States Department of Agriculture, Systematic Mycology and Microbiology Lab, Rm. 304, B-011A, 10300 Baltimore Ave., Beltsville, Maryland, 20705, USA. ³University of Maryland, Department of Plant Sciences and Landscape Architecture, 2112 Plant Sciences Building, University of Maryland, College Park, MD, 20742, USA. ⁴United States Department of Agriculture, Systematic Mycology and Microbiology Lab, Rm. 304, B-011A, 10300 Baltimore Ave, Beltsville, Maryland, 20705, USA.

STOLZE-RYBCZYNSKI, J.L.¹, CUI, Y.¹, FISCHER, M.W.F.², MONEY, N.P.¹

Adaptation of the spore discharge mechanism in the Basidiomycota.

The ballistospore discharge mechanism is a defining characteristic of the Basidiomycota. This extraordinary launch process is powered by the rapid movement of a drop of fluid, called Buller's drop, over the spore surface. Ballistospore discharge is an example of a fast fungal movement and its analysis requires the use of ultra-high-speed video cameras. Video data and estimates of energy usage during spore discharge reveal how the mechanism is adapted to limit discharge distance in species with gilled and poroid fruiting bodies, and to maximize range in basidiomycetes that sporulate on exposed surfaces. Discharge distance is determined by both spore size and the size of Buller's drop. The size of Buller's drop is controlled by spore shape, which means that seemingly minor changes in spore morphology exert major effects upon discharge distance. Based on these observations, we hypothesize that evolutionary modifications to fruiting body architecture, including changes in gill separation and tube diameter, must be tightly linked to alterations in spore morphology.

¹Miami University, Botany, 700 East High Street, 316 Pearson Hall, Oxford, OH, 45056, USA. ²College of Mount St. Joseph, Chemistry & Physical Sciences, 5701 Delhi Road, Cincinnati, OH, 45233, USA

WALKER, JENNIFER KM, WARD, VALERIE, TWIEG, BRENDAN, JONES, MELANIE D.

Analysis of the community structure of ectomycorrhizal root tips in coarse woody debris retention and removal plots at a high elevation spruce forest reveals a surprising member.

Shifts in ectomycorrhizal fungal (EMF) community composition occur after clearcut logging, resulting in the loss of some forest species. Decayed wood is a remnant of the original forest and an important habitat for particular EMF species. Therefore, retention of coarse woody debris (CWD) at harvest is expected to contribute to the long-term preservation of pre-harvest community structure because as it decays, niches for EMF will be maintained. In order to assess if leaving CWD after clearcutting has a medium-term effect on the EMF community, we examined ectomycorrhizal root tips in CWD retention and CWD removal plots at a high elevation spruce forest 12 years after harvest. Two 1 ha treatment plots are located in each of three replicate 10 ha clearcut blocks. Root tips were sampled from ten 10 yr-old saplings in each treatment plot. The tips were grouped morphologically and identified by sequencing of the ITS region.

Fungal DNA detected included that of *Alloclavaria purpurea*, whose mycorrhizal status has been suspected but remains unconfirmed. When suspect samples were cloned and sequenced, DNA of other fungal species was not detected. Consequently, although further work is required, we believe that *A. purpurea* was forming the mycorrhizas.

Telephora terrestris colonized 17.6% of the root tip community, and dominated at one block. Interestingly, *A. purpurea* colonized 7.3% of all tips, but was not detected at this block. Analysis of the relative abundance of all taxa detected no significant effect of CWD retention or removal, but there was a significant difference in the relative abundance of taxa between blocks. We conclude that retention of CWD has not affected the EMF community at the plot scale over the medium term. We are now conducting sampling at a finer scale to determine if ectomycorrhizal communities differ in close proximity to the 12-yr-old logs.

University of British Columbia Okanagan, Biology and Physical Geography, 3333 University Way, Kelowna BC, V1V 1V7, Canada

MYCOLOGICAL NEWS

Annual Gulf States Mycology Society Summer Foray

The Annual Gulf States Mycological Society Summer Foray was held July 10-12 at Hillsdale, MS. In addition to forays to the nearby Upper Pascagoula Wildlife Management Area and DeSoto National Forest and a delicious shrimp boil by W. David Fuller, we were treated to presentations by graduate student Paul Scott of Mississippi State University (“My Meandering mit miscellaneous Mississippi mushrooms”) and Dr. Rod Tulloss (“Introduction to *Amanita*”). Many thanks go to foray organizers David and Patricia Lewis for a wonderful weekend. The GSMS will host the NAMA 2009 Foray in the heart of Cajun country at Lafayette, Louisiana November 26 -29. For more information and a registration form, see this issue of *Inoculum*. Laissez les bons temps rouler!

—Allison Walker
a.k.walker@usm.edu



Foray sites included this cypress swamp in the Upper Pascagoula Wildlife Management Area, George County, MS. Photo by Ben Rauch.



Participants from left to right (standing): Alexandra Tussing, David Lewis, Rod Tulloss, Mary Tulloss, Matthew Keirle, Don Yeltman, Odin Toness, Jay Justice, Don Ward, Patch Scott, Julia O’Neal, Peyton Wilson, Paul Scott, Therese Martin, Clark Ovrebo, Jake Walker, Jarrell Smith, W. David Fuller. From left to right (seated): Phillip Tussing, Nancy Cook, Julie Gaylord, Ben Rauch, Allison Walker, Heinz Gaylord. Photo by Ben Rauch.

XIII Latin American Marine Sciences Congress

COLAC/MARCUBA 2009: XIII Latin American Marine Sciences Congress, Havana, CUBA, with extended tour for research and site visits: October 23 — November 1, 2009

COLOC/MARCUBA 2009 brings together marine scientists, other marine professionals and engineers, along with coastal and marine educators, sociologists, economists, businesspeople and policy managers, to explore the following main themes:

- * Integrated Development: the Role of Marine Sciences
- * Human Impact on Coastal Zones and Oceans
- * Climate Change, Natural Disasters and Marine Ecosystems
- * Seas and Oceans as a Source of Renewable Energy
- * Marine Biodiversity, Conservation and Connectivity
- * Biotechnology and Aquaculture Management of Marine Mammals in Controlled Environments

“The island of Cuba lies at the convergence of the Atlantic Ocean, Caribbean Sea and Gulf of Mexico. Its coastal waters are dense with islets, keys, and reefs that provide key habitats and spawning and nursery grounds for a rich array of fishes, invertebrates, endangered sea turtles, manatees, and other marine life. Because of the prevailing currents and Cuba’s proximity to the United States and Mexico, preserving Cuba’s biodiversity is critically important to the environmental and economic health of coastal communities in neighboring countries, including the southern United States.

Greater communication and collaboration among scientists, conservation professionals and government agencies will benefit both the American and Cuban people, and the shared ecosystems to which both nations are so intimately linked. Active scientific and management cooperation is especially urgent if we are to address the growing threats to coral reefs, ocean fish populations, habitats for migratory birds, marine mammals and turtles, and biodiversity shared throughout the region.”

— Dan Whittle, Environmental Defense Fund

Highlights:

- * Participation in the COLAC/MARCUBA conference with marine scientists from Cuba and many other countries
- * Small group meetings in the evenings, according to interest, with Cuban marine scientists and other Cuban environmental professionals
- * City tour of Havana with a focus on projects in sustainable development
- * Full or half day of scuba diving or snorkeling in rich reef area of a coastal Bio Reserve
- * Community meetings with Cubans who make their living from coastal activities and those who advise them
- * Optional cultural activities

All site visits will be co-led by a Cuban expert in environmental protection and sustainable development or Cuban marine scientist, and translator.

This conference and research tour will be organized by a licensed Cuba Travel Service Provider. The cost (\$2500) includes: round trip flight from Cancun to Havana, in-country transportation, Cuban visa, double accommodations, 2 meals per day, conference fee, program guides, site visits, and translation.

Eco Cuba Exchange promotes environmental interchange between U.S. and Cuban environmentalists. Global Exchange has 20 years experience organizing professional, educational, cultural, and “people to people” study tours to Cuba on every aspect of Cuban life.

Additional articles on environmental protection and sustainable development in Cuba are available on our web pages at <http://www.ecocubaexchange.org>. Online web page for this research tour and congress: <http://www.globalexchange.org/tours/1006.html>

Contact: Pam Montanaro . ECO CUBA EXCHANGE
<http://www.ecocubaexchange.org>
A project of Global Exchange .
<http://www.globalexchange.org>
pamela@barglow.com . 510-649-1052 or 510-318-4910

Fungal Conservation: A Special International Meeting

Fungal Conservation: science, infrastructure and politics, a special international meeting. 26-30 October 2009, Whitby, North Yorkshire, UK. A lot of important and exciting developments have occurred in fungal conservation during the last two years, and this special international meeting will bring people interested in fungal conservation up to date with those developments. The meeting is being organized through the European Council for Conservation of Fungi (the conservation wing of the European Mycological Association). Representatives from the IUCN’s five fungal Special-

ist Groups and from continental-level and national fungal conservation groups will be involved, but anyone with a genuine interest in promoting fungal conservation is also welcome to participate. The program will address three important aspects of conservation: science, infrastructure and politics. For more information, visit the meeting website, www.cybertruffle.org.uk/whitbymycosynod.

—David Minter
d.minter@cabi.org

NAMA/GSMS Foray

NAMA/GSMS FORAY LAFAYETTE, LA NOV 26-29, 2009

NAMA's very first visit to the state of Louisiana is set in the city of Lafayette, November 26–29, 2009. The Gulf States Mycological Society will treat us to the fascinating and colorful culture of Acadiana and the experience of this unique section of our country. We will be able to hunt fungi in cypress-tupelo forests, in magnolia woodlands, among live oaks and wetlands as well as mature hardwood and pine stands. We may also have the opportunity to collect on an island preserve. Our field trips will include forays in several state parks, including one at the site of the Louisiana State Arboretum. We will also have the opportunity to collect mushrooms on Nature Conservancy property and on private lands. We anticipate some unusual fungi that thrive in this sub-tropical environment. Drs. Clark Ovrebo and Juan Mata will serve as co-mycologists to head up a list of varied programs and workshops. Both have deep experience with Deep South fungi and will be supported by others who work in the bayous and low country landscapes. We will have a microscopy workshop on Monday - Wednesday of that week for an additional charge, with instructors Wal-

ter Sundberg and Andy Methven. Microscopes will be provided for hands-on instruction. The event will be housed at the Holiday Inn Lafayette, 2032 NE Evangeline Thrwy. For those who prefer more rustic accommodations, there is a campground near the city. Restaurants abound in the area, and one can sample dishes such as gumbo, crawfish, boudin, crabs, etouffees, alligator and a wide assortment of fish. Lafayette Regional Airport is serviced by four major airlines: Continental, American, Delta and Northwest. A free airport shuttle is provided by the hotel. Car rental agencies include Avis, Budget, Enterprise, Hertz, and National. Other nearby airports include Baton Rouge Metropolitan Airport, 60 miles; Lake Charles Regional Airport, 75 miles; Alexandria International Airport, 90 miles; and New Orleans International Airport, 130 miles.

Registration is open until Oct. 19, 2009. Save the dates and sign up early for a Cajun holiday, with a French twist, zydeco and all! Additional information can be found at www.namyco.org and www.gsmmyco.org.

—Allison Walker

a.k.walker@usm.edu

(Modified from www.gsmmyco.org and www.namyco.org)

MYCOLOGIST'S BOOKSHELF

Four books are reviewed in this issue. Nine new books were received since the last Mycologist's Bookshelf. If you know of a newly published book that might be of interest to mycologists, please let me know so that I can request it from the publisher. Amy.Rossman@ars.usda.gov.

Fungi of Australia: Smut Fungi

Fungi of Australia: Smut Fungi. 2008. K. Vanky, R.G. Shivas. CSIRO Publishing, <http://www.publish.csiir.au/nid/18/pid/5729/htm>. ISBN: 978-0-643-09536-6. 276 pp. plus CD. Price: 130 AU\$.

This book is a nicely produced and maintains the typical high standard of Kálmán Vánky's work on smut fungi. The book is complete with information concerning the smut fungi of Australia. I would recommend that every mycologist interested in smuts obtain this book.

The book comprises five chapters, three appendices plus references and an index. Chapter 1, the introduction, provides a detailed account of the history of the study of smut fungi in Australia as well as a section on the biology of smut fungi. The systematic arrangement of smut fungi is outlined, followed by a well-organized key to the genera of smut fungi of Australia.

The main context of the book deals with the smut fungi, genus by genus. Each account provides a description and discussion of the genus and a detailed description of each species known from Australia in that genus. Known hosts and collection details are also given. Appendix 1 is a thorough host index, Appendix 2 includes lectotypifications and Appendix 3 de-

scribes a new species, the latter being provided with the only illustration in the book. An extensive bibliography followed by abbreviations and an index to fungi completes the book. A Lucid key is also provided as a CD accompanying the book; the CD also has the text and host index.

I would have liked to have seen an abstract and more diagrams and color photographs in a book of this sort. However, these are provided in the CD; such diagrams in the book would certainly have made it look more interesting. Most likely there were cost constraints. The book is well laid out but has rather small print. It is carefully written and very pleasing. The headers are logical, so it is easy for the reader to find the relevant part of the text. The book is also provided with a thorough literature list and a good index. The book should be available in all college, university, research laboratories and institutional libraries where there are courses and research in agriculture or mycology.

—Kevin Hyde

School of Science
Mae Fah Luang University
Chiang Rai, Thailand
khyde1@gmail.com

Bryophyte Biology

Bryophyte Biology, 2nd Edition. 2009. Bernard Goffinet, A. Jonathan Shaw (eds.). Cambridge University Press, The Edinburgh Building, Cambridge CB2 8RU United Kingdom, www.cambridge.org. ISBN: 978-0-521-87225-6 hardback; ISBN: 978-0-521-69322-6 paperback. 565 pp. Price: hardback \$150.00; paperback \$70.00.

Often overlooked, bryophytes are second only to Angiosperms in their diversity with approximately 12,700 described species among the mosses, 5 to 8,000 extant liverwort species and 100-150 hornworts. In addition to their intrinsically interesting characteristics, they often serve as models for behaviors of more morphologically complex plants. The dominance of the gametophyte makes them similar to most fungi in terms of their population biology, as does their frequently clonal reproduction. Also, their relatively simple morphology has made arranging natural taxonomies similarly difficult and subject to extensive revisions with the advent of molecular technologies. These and other subjects are the focus of this new text, unfortunately called a second edition. In fact, according to the preface, it is not a revision of the earlier edition, but an entirely new book.

The volume is not for the beginner in bryology. Rather, as the editors suggest, it is for advanced graduate students and researchers with an interest in the current state of affairs. Indeed, it is so up-to-date, that it may already be passé — the chapter on liverwort taxonomy and morphology concludes with a note, added in proof, erecting a new family (Herzogianthaceae)! Mycology is, of course, in a similar state of flux as genomic information has caused us to re-arrange our taxa and formulate new phylogenetic reconstructions. Their ephemeral nature is intrinsic, as is their necessity. The entire text represents a valuable contribution, its various authors demonstrate highest levels of expertise and the editors have harmonized most of the presented information. It reflects the state of the art and identifies research areas for the current and next generation of bryologists.

There is a chapter covering the morphology and taxonomy of each of the three phyla Marchantiophyta, Bryophyta and Anthrophyta that is informed by the latest mitogene sequence data and analyses. To fully follow them one would be best served by having an introductory text or atlas close at hand, since there are no line drawings and few photographs. The liverworts are outlined to the level of family. They are most likely the sister group of vascular plants. The true mosses (Bryophyta) are divided into five superclasses (no formal taxonomic rank). Superclass I contains a single class with a single family; Superclass II contains the single class Sphagnopsida with two orders, one containing the very important *Sphagnum*. Superclasses III and IV are, again, represented by single families. Superclass V is where most of the terminal diversity within the Bryophyta is found. It would be of benefit to illustrate the albeit putative pattern of character changes that give rise to these groupings. Goffinet and his co-authors instead note the tentative nature

of their proposed arrangements at the ordinal and familial levels. Although cladistic and pattern cladistic analyses are verbally described for all three phyla, only the hornworts are described with a rooted tree. What is most gratifying is to see how genomic information has inspired the (frequently successful) search for differentiating morphological characters. The fourth chapter discusses the three groups in phylogenomic terms and placed in context as the first plant colonizers of terrestrial environments. The next chapter by A.C. Cuming is a superb primer about mosses as model organisms. If *Arabidopsis thaliana* is the *Drosophila melanogaster* of plants, *Physcomitrella patens* is the *Caenorhabditis elegans*. Uniquely among studied plants, it is amenable to homologous recombination with targeted transformation efficiencies similar to those of *Saccharomyces*. This characteristic has encouraged the complete sequencing of its genome and the identification of key mechanisms of genetic control in plant development and cellular differentiation. It has given insight into mechanisms of gene repair and the evolution of transcriptional networks and revealed specifics of directional growth in response to light and gravity. The similarity to *C. elegans* is due also to the fact that, being one cell layer thick for much of its life cycle, cellular differentiation and development can easily be visualized under light microscopy; *P. patens* is a central tool in the program to understand plant evolution and development (*i.e.* evo-devo).

Bryophytes confront similar eco-physiological problems to lichens; both groups are poikilohydric, that is, they equilibrate rapidly to the external environment. This has implications for their ability to function, compete and survive. Both are frequently nutrient limited and primary colonists of substrata where rooted organisms cannot compete: *e.g.* bare rock; epiphytic environments; and areas subject to environmental extremes. Unlike vascular plants and most other organisms bryophyte diversity is greatest at higher latitudes, although there are areas of tropical hyperdiversity. Their lack of absorptive structures, stomata, specialized adaptation for gas and water management make them good analogs for comparative studies with lichens that might provide reciprocal evidence for eco-physiologically adaptive features. Several bryophytes live in association with internal symbionts. Among them are nitrogen-fixing *Nostoc* found living in differentiated channels in hornworts; these contribute significantly to nutrient flow in boreal ecosystems. Surprising to this reader, mycorrhizal associations with several liverworts and hornworts were noted. These symbioses are mostly mentioned as asides and not adequately discussed. Since bryophytes do not develop roots, their interactions with substrata are also similar to those of lichens. Some bryophytes are tolerant of extreme desiccation. The processes that permit desiccation tolerance and rehydration have been the subjects of major research effort and are described in a separate chapter.

Continued on following page

Two chapters are devoted to *Sphagnum*. Bogs and poor fens are the only environments in which mosses are dominant. *Sphagnum* bogs are important in carbon sequestration, hence in global climate buffering. The environmental variables that determine their viability interact, which presents analytical difficulties for observational studies. The figures in these chapters are frequently confusing and ambiguous and lend themselves to interpretations different from those presented. Nevertheless, there is much of value in these chapters for those interested in peat formation, bog and fen ecology or concerned with understanding, monitoring and modifying climate.

A chapter follows that describes the population and community biology of bryophytes. The principles should be familiar to mycologists interested in these same issues. A chapter on species and speciation is next and this presentation is of greater novelty and interest. Modern species concepts are presented and shown to be more or less useful depending on the specific researcher's perspective. Those interested in delimitation of species tend more towards an acceptance of a phylogenetic species concept, while those interested in processes of speciation tend to accept biological species concepts. As in plants, there are many cases of multiple hybridization events leading to allopolyploids. Clearly, these groups are polyphyletic, yet they exist as biologically meaningful units. What is a strict phylogenetic taxonomist to do? The mosses and liverworts both seem to be replete with cryptic species and efforts at modeling phylogeographic histories need adequately delimited species in order to develop

testable hypotheses related to gene flow, reproductive isolation, gene fixation and interspecific competition.

The final chapter discusses the conservation biology of bryophytes. Those characteristics that make bryophytes particularly vulnerable are clearly elaborated and the consequences of habitat fragmentation are revealed. Except in Finland and Scandinavia, bryophytes have rarely been considered in identifying and designing zones for the conservation of biodiversity. As noted by the authors of this thought provoking chapter, both extant species and the processes of speciation are in need of preservation.

This is a valuable treatise in that much of current research activity is summarized, including identification of major gaps in our understanding. It would be improved by line drawings illustrating the morphological details discussed in the first three chapters, as well as by trees that summarize the state of our current understanding of bryophyte phylogeny. The index is adequate, although one term that I sought for clarification of its use in a later chapter was not indexed to its first use; the volume would well profit from a glossary. While this tome is not for every mycologist, the bryophytes are grossly similar in their life strategies to lichens, in particular, and fungi more generally, as to offer insight into areas of mycological interest — perhaps 19th century botanists were wise to group them together as cryptogams.

—David Yohalem
East Malling Research
East Malling, Kent ME19 6BJ
United Kingdom
david.yohalem@emr.ac.uk

Compendium of Onion and Garlic Diseases and Pests

Compendium of Onion and Garlic Diseases and Pests, 2nd Edition. 2008. Howard F. Schwartz, S. Krishna Mohan (eds). APS Press, 3340 Pilot Knob Road, St. Paul, MN 55121, <http://www.shopapspress.org>. ISBN: 978-0-89054-357-3. 127 pp. Price: \$59.00.

Twenty three specialists of the highest stature belonging to the most prestigious universities and institutions of the USA and Canada contributed to this useful second edition of the *Compendium of Onion and Garlic Diseases*. This *Compendium* is divided into three major parts. Part I, Infectious/Biotic Diseases, treats sixty (60) diseases, organized into different categories based on the causal organism: fungi or oomycetes (37 diseases), bacteria and yeasts (11 diseases), nematodes (six diseases), viruses and phytoplasmas (five diseases), and parasitic flowering plants (one disease). Fungal and/or Oomycete diseases are subclassified in relation to the part of the plant affected: subterranean parts (13 diseases), aerial parts (15 diseases), or bulbs (nine diseases). Part II, Pests, includes eight (8) diseases caused by insect pests. Part III, Noninfectious/Abiotic Conditions, describes 12 diseases caused by environmental stresses.

An Introductory chapter gives general characters and interesting data related to pathogen and pest management. Each of the sixty diseases treated in this *Compendium* is organized as follows: common name of the disease, with a short intro-

ductory paragraph; symptoms, with changes described in the diseased vs healthy plant; causal organism based on the classification and morphology of the disease agent; disease cycle and epidemiology including description of the time of the year, structures produced, environmental conditions and how these trigger different steps of the cycle; management, presenting practical data on how to minimize and eradicate the disease; selected references, including relevant literature on each of these diseases. Photographs are included of the disease symptoms in the field, and light and SEM microscopic photographs of the structures of the causal organisms, along with diagrams of the disease cycles and tables providing different kinds of information relevant for each disease. The useful *Compendium* ends with a glossary that starts with a conversion table and a complete index. This volume is essential for any onion and garlic grower around the world, as well as plant pathologists, students in this area, agronomists, and anyone interested in learning how to grow onion and garlic. Highly recommended!

—Teresa Iturriaga,
Dpto. Biología de Organismos
Universidad Simón Bolívar,
Sartenejas, Baruta, Edo. Miranda
Venezuela
teresitaiturriaga@yahoo.com

Checklist of Polish Larger Ascomycetes

Checklist of Polish Larger Ascomycetes. 2006. M.A. Chmiel. Biodiversity of Poland. Vol. 8. W. Szafer Institute of Botany, Polish Academy of Sciences, Krakow, www.ib-pan.krakow.pl. 149 pp. Price: €30.00.

This brightly colored book contains a list of larger ascomycetes identified in Poland including Heliales, Pezizales, Rhytismatales, and Thelebolales. There is a brief introduction that deals with the history of collections, Latin nomenclature, Polish names, substrates and works cited. The entries include current species name and synonyms, substrate, and references. The ref-

erence list at the back is comprehensive. This book is a basic checklist compiled from the literature. The paper used in the printing is acceptable and the print size readable. The book should be available in all college and university libraries and research institutions dealing with mycology.

—Kevin Hyde

School of Science
Mae Fah Luang University
Chiang Rai, Thailand
Khyde1@gmail.com

Recently Received Books

- **Biodiversity and ecology of lichens.** 2009. André Aptroot, Mark R.D. Seward, Laurens B. Sparrius (eds.). J. Cramer, Berlin <https://www.schweizerbart.de>. ISBN: 978-3-4443-58078-0, *Bibliotheca Lichenologica* 99: 1-439. Price: €89.00. *Review needed.*
- **Diversity, Ecology, and Conservation of Truffle Fungi in Forests of the Pacific Northwest.** 2009. James M. Trappe, Randy Molina, Daniel L. Luoma, Eftén Cázares, David Pilz, Jane E. Smith, Michae A. Castellano, Steven L. Miller, Matthew J. Trappe. United States Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-772, <http://www.fs.fed.us/pnw/contact/index.shtml>. 194 pp. plus CD. Price: available upon request. *Requested from publisher.*
- **Fungi in Biogeochemical Cycles.** 2006. Geoffrey M. Gadd (ed.). Cambridge University Press, Cambridge, www.cambridge.org. ISBN: 978-0-521-84579-3. 469 pp. Price: \$179.00. *Review needed.*
- **The Genus *Crepidotus* in Europe.** 2008. Giovanni Consiglio, Ledo Setti. Associazione Micologica Bresadola, http://www.ambresadola.it/Editoria/new-book_ing.htm, 344 pp. incl. 140 color microphotographs. Price: €60.00 plus mailing charges. *Review copy requested.*
- **Microbiologically Safe Foods.** 2009. Norma Heredia, Irene Wesley, Santo García (eds.). John Wiley & Sons, Inc., <http://www.wiley.com>. 667 pp. Price: \$135. *Review needed.*
- **Mushrooms of the Pacific Northwest.** 2009. Steve Trudell, Joe Ammirati. Timber Press, www.timberpress.com. ISBN: 978-0-88192-935-5. 352 pp. plus 530 color photos, 22 line drawings. Price: \$27.95. *Review needed.*
- **Milk Mushrooms of North America. A Field Identification Guide to the Genus *Lactarius*.** 2009. Alan E. Bessette, David B. Harris, Arleen R. Bessette. Syracuse University Press, <http://www.syracuseuniversitypress.syr.edu/fall-2009/milk-mushrooms.html>. ISBN: 978-9-8156-3229-0. Price: \$110.00. *Requested from publisher.*
- **A Preliminary Checklist of Micromycetes in Poland.** 2008. Wiesław Mulenko, Tomasz Majewski, Małgorzata Ruskiewicz-Michalska. IB Publisher, Polish Academy of Sciences, www.ib-pan.krakow.pl. ISBN: 978-83-89648-75-4. 752 pp. Price: €74.00. *Review in progress.*
- **Taxonomy, Phylogeny, and Ecology of Bark-Inhabiting and Tree-Pathogenic Fungi in the Cryphonectriaceae.** 2009. Mariëka Gryzenhout, Brenda D. Wingfield, Michael J. Wingfield. APS Press, 3340 Pilot Knob Road, St. Paul, MN 55121, <http://www.shopapspress.org>. ISBN: 978-0-89054-367-2. 199 pp. Price: \$119.00. *Review needed.*

Previously Listed Books

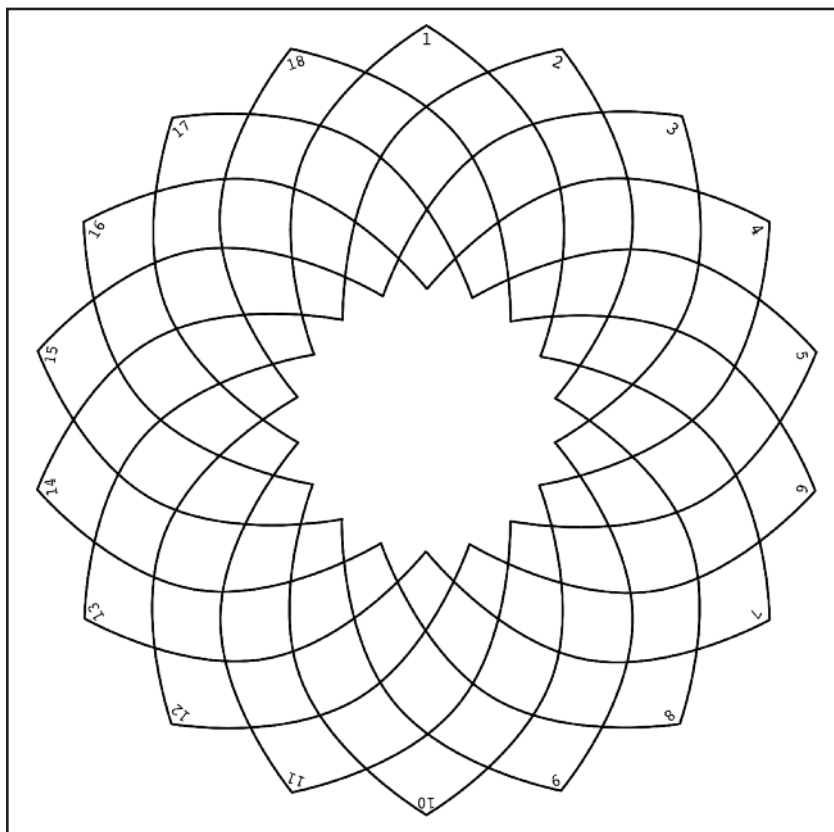
- **Black fungal extremes.** 2008. G.S. de Hoog, M. Grube (eds.). Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, <http://www.cbs.knaw.nl/publications/index.htm>. *Studies in Mycology* 61: 1-194. Price: €60.00. *Review needed.*
- **Bryophyte Biology, 2nd Edition.** 2009. Bernard Goffinet, A. Jonathan Shaw (eds.). Cambridge University Press, The Edinburgh Building, Cambridge CB2 8RU United Kingdom, www.cambridge.org. ISBN: 978-0-521-87225-6 hardback; ISBN: 978-0-521-69322-6 paperback. 565 pp. Price: hardback \$150.00; paperback \$70.00. *Reviewed in this issue.*
- **Compendium of Onion and Garlic Diseases and Pests, 2nd Edition.** 2008. Howard F. Schwartz, S. Krishna Mohan (eds.). APS Press, 3340 Pilot Knob Road, St. Paul, MN 55121, <http://www.shopapspress.org>. ISBN: 978-0-89054-357-3. 127 pp. Price: \$59.00. *Reviewed in this issue.*
- **Dictionary of the Fungi, 10th Edition.** 2008. P.M. Kirk, P.F. Cannon, D.W. Minter, J.A. Stalpers (eds.). CAB International, Wallingford, Oxon OX10 8 DE United Kingdom, www.cabi.org. ISBN: 978-0-85199-826-8. Price: £70.00/\$140.00/€110.00. *Reviewed in May-Jun 2009.*
- **Ecological Impacts of Non-Native Invertebrates and Fungi on Terrestrial Ecosystems.** 2009. David W. Langor, John Sweeney (eds.). Springer, www.springer.com. ISBN: 978-1-4020-9679-2. 157 pp. Price: \$95.00. *Review needed.*
- **Enfermedades Forestales en México. Forest Diseases in Mexico.** 2007. David C. Tovar, Dionisio A. Rosales, Silva E.G. Díaz (eds.). Universidad Autónoma Chapingo. México; CONAFOR-SEMARNAT, México; Forest Service USDA, EUA; NRCAN Forest Service, Canadá y Comisión Forestal de America del Norte, COFAN, FAO. Chapingo, México. ISBN 968-02-0340-9. 587 pp. Price: ca. \$70.00. *Reviewed in May-Jun 2009.*
- **Fungal Pathogenesis in Plants and Crops. Molecular Biology and Host Defense Mechanisms, 2nd Edition.** 2008. P. Vidhyasekaran. CRC Press, Boca Raton, FL 33487, <http://www.crcpress.com>. ISBN: 978-0-8493-9867-4. 509 pp. Price: \$169.95. *Review in progress.*
- **Fungi of Australia: Smut Fungi.** 2008. K. Vanky, R.G. Shivas. CSIRO Publishing, <http://www.publish.csiro.au/nid/18/pid/5729/htm>. 276 pp. plus CD. Price: 130 AU\$. *Reviewed in this issue.*
- **The Genera of the Parmulariaceae.** 2008. Carlos A. Inácio, Paul F. Cannon. Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, <http://www.cbs.knaw.nl/publications/index.htm>. ISBN: 978-90-70351-72-4. ISSN: 157-8859. *Biodiversity Series* 8. 196 pp. Price: €65.00. *Review needed.*
- **Hongos de Parques y Jardines y sus Relaciones con la Gente.** 2008. Gastón Guzmán. Departamento de Apoyo Editorial de la Coordinación de Bibliotecas y Centros de Información Documental de la SEV, Av. Araucarias núm. 5, Edificio Orense II, tercer piso, Col. Esther Badillo, C. P. 91190, México. apoyoeditorialsec@sever.gob.mx ISBN: 978-970-670-170-1. Available as pdf: <http://www.sev.gob.mx/servicios/publicaciones/memver/hongosparquesy jardines.pdf> Price unknown. *Reviewed in May-Jun 2009.*
- **Leaf-inhabiting Genera of the Gnomoniaceae, Diaporthales.** 2008. Mikhail V. Sogonov, Lisa A. Castlebury, Amy Y. Rossmann, Luis C. Mejia, James F. White. Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, <http://www.cbs.knaw.nl/publications/index.htm>. *Studies in Mycology* 61: 1-79. Price: €40.00. *Reviewed in May-Jun 2009.*
- **Pioneer Naturalist on the Plains: The Diary of Elam Bartholmew 1871-1934.** 1998. David M. Bartholmew. Sunflower University Press, 1531 Yuma, P.O. Box 1009, Manhattan, KS 66505-1009. ISBN: 0-89745-221-6. 338 pp. Price: Free. Contact Amy.Rossmann@ars.usda.gov. *Review in progress.*
- **Plant Pathology. Concepts and Laboratory Exercises, Second Edition.** 2008. Robert N. Trigiano, Mark T. Windham, Alan S. Windham (eds.). CRC Press, Boca Raton, FL 33487, <http://www.crcpress.com>. ISBN 13:978-1-4200-4669-4. 558 pp. plus CD. Price: £42.99. *Review in progress.*

TAKE A BREAK

MycoLotus2

All words are 5 letters in length. For example, Clockwise clue #1 and Counter-Clockwise clue #1 both start from the square marked #1, then curve in to the centre. The last letter of Clockwise clue #1 is also the last letter of Counter-Clockwise clue #5. This crossword may be reproduced with permission from the author and the Editor of Inoculum.

—Juliet Pendray
aloe@netrover.com



CLOCKWISE

1. Polypore genus
2. Greek for shape
3. Apothecia shapes
4. A usually lichenized resinicolous discomycete
5. Polish for Blewit
6. Laticifer product
7. Meat treated to prevent spoilage by fungi and bacteria
8. *Wolfiporia's* basionym
9. Hecate's daughter who turned men into pigs
10. *Septobasidium's* insect
11. (2 words) One rostrum
12. Possessed by a mycocultural ant genus?
13. Opportune times or good fortunes, in obsolete English
14. _____ George's Mushroom

15. Works or bends
17. Increases
18. Make a spore pattern

15. Coined the term "fungi"
16. Nuclei groupings when starting to enter clamp connections
17. Square patterns
18. Parilia festival on April 21 celebrates this Roman Cattle deity

COUNTERCLOCKWISE

1. Rings made by *M. oreades*
2. eg. *Rhizopus* and *Cladosporium*
3. Mushroom-shaped salt _____ are diapires
4. Fathers
5. Emitted by mushroom show volunteers when visitors admit to eating un-identified mushrooms from their lawns
6. *Suillus grevillei* partner
7. Asci, to ascospores
8. Santal (India) for a *Scleroderma* species, or a mushroom with a soul
9. Musician Armando Anthony a.k.a. "Chick"
10. Wasp genus symbiotic with *Amylostereum*
11. Taste of eg. *Tylopilus felleus*
12. _____ Wilt happens when "Agent Green" a.k.a. *Fusarium oxysporum* attacks *Musa textilis*
13. Plant part not penetrated during mycorrhizal attachment
14. Thick bristles, as on a lichen upper thallus
15. Spinach in Indian cuisine

MycoLotus 2 Answers

10. Scale	11. Abeak	12. Atlas	13. Selas	14. Saint	15. Pliny	16. Pairs	17. Grids	18. Pales
1. Fomes	2. Morph	3. Discs	4. Sarea	5. Gaska	6. Latex	7. Cured	8. Poria	9. Circe
10. Fairy	11. Acrid	12. Abaca	13. Stele	14. Setae	15. Palak	16. Piles	17. Gains	18. Print
2. Molds	3. Domes	4. Sires	5. Casps	6. Larch	7. Cases	8. Putka	9. Corea	

Clockwise

CounterClockwise

Cookery Corner



Crab Stuffed Mushrooms

What a nice thing to happen to a mushroom! The Crab Stuffed Mushrooms are prepared with an intriguing combination of herbs, peppers, Dijon mustard, and white cheddar cheese; an excellent party appetizer recipe, and step up for stuffed mushrooms.

www.greatpartyrecipes.com

1 ½ lb white mushrooms
4 green onions, chopped
3 cloves garlic, minced
1 tbl fresh basil, chopped
¼ cup fresh cilantro, chopped

1 fresh green chile, seeded and finely chopped
1 lb crab meat, shelled and flaked
½ tsp Dijon mustard
1 tbl ground red pepper
6 oz white cheddar cheese, grated

Wipe the mushrooms clean with a damp paper towel and remove the stems. Place the mushroom caps on a shallow baking dish. Mince the stems. Combine all the remaining ingredients, including

the minced stems, and mix well. Spoon the mixture into the mushroom caps and bake in a preheated 350° oven for 15 minutes. Serve warm. Makes about 24 appetizers.

MYCOLOGICAL CLASSIFIEDS

Mold Testing and Identification Services

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testing for fungal resistance of materials. 10% discount for regular and sustaining MSA members. Email microbe@pioneer.net. For more information see www.abbeylab.com.

Mycological Society of America – Gift Membership Form

Sponsoring a gift membership in MSA offers tangible support both for the recipient of the membership as well as for mycology in general. Providing both *Mycologia* and *Inoculum*, a gift membership is an excellent way to further the efforts of our mycological colleagues, especially those who cannot afford an MSA membership. In addition to a feeling of great satisfaction, you also will receive a convenient reminder for renewal of the gift membership the following year.

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I agree to pay \$98* for this membership by check (payable to MSA, drawn on US bank) VISA Mastercard
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Send this form to: MSA Business Office, PO Box 1897, Lawrence KS 66044
or FAX to (785) 843-1274, Attn: Processing Department

*If this membership is given after June 1, please add \$10 to cover postage for past issues.

MYCOLOGY ON-LINE

Below is an alphabetical list of websites featured in *Inoculum*. Those wishing to add sites to this directory or to edit addresses should email <jinx.campbell@usm.edu>. **Unless otherwise notified**, listings will be automatically deleted after one year (at the editors discretion).

A New Web Page About Tropical Fungi,
Hongos Del Parque "El Haya" (58-5)
hongosdelhaya.blogspot.com/

Ascomycota of Sweden
www.umu.se/myconet/asco/indexASCO.html

Bibliography of Systematic Mycology
www.speciesfungorum.org/BSM/bsm.htm

Cold Spring Harbor Laboratory; Meetings & Courses Programs (58-2)
meetings.cshl.edu

Collection of 800 Pictures of Macro- and Micro-fungi
www.mycolog.com

Cordyceps Website
www.mushtech.org

Cornell Mushroom Blog (58-1)
hosts.cce.cornell.edu/mushroom_blog/

Cortbase (58-2)
andromeda.botany.gu.se/cortbase.html

Corticoid Nomenclatural Database (56-2)
www.phyloinformatics.org/

The Cybertruffle internet server for mycology seeks to provide information about fungi from a global standpoint (59-3).
www.cybertruffle.org.uk

Cyberliber, a digital library for mycology (59-3).
www.cybertruffle.org.uk/cyberliber

Cybernome provides nomenclatural and taxonomic information about fungi and their associated organisms, with access to over 548,000 records of scientific names (59-3).
www.cybertruffle.org.uk/cybernome

Dictionary of The Fungi Classification
www.indexfungorum.org/names/fundic.asp

Distribution Maps of Caribbean Fungi (56-2)
www.biodiversity.ac.psiweb.com/carimaps/index.htm

Entomopathogenic Fungal Culture Collection (EFCC)
www.mushtech.org

Fun Facts About Fungi (55-1)
www.herbarium.usu.edu/fungi/funfacts/factindx.htm

Fungal Environmental Sampling and Informatics Network (58-2)
www.bio.utk.edu/fesin/

Fungi of Ecuador
www.mycology.com/Ecuador.html

German Mycological Society DGfM
www.dgfm-ev.de

HighWire Press (58-3)
mycologia.org

Humboldt Institute — Located on the eastern coast of Maine, the institute is known for the extensive series of advanced and professional-level natural history science seminars it has offered in Maine since 1987, along with ecological restoration seminars and expeditions to the neotropics. It publishes the *Northeastern Naturalist* and *Southeastern Naturalist*, two scholarly, peer-reviewed, natural history science journals which provide an integrated publishing and research resource for eastern North America, including eastern Canada. 59(4)

www.eaglehill.us
www.eaglehill.us/programs/nhs/natural-history-seminars.shtml
www.eaglehill.us/nena
www.eaglehill.us/sena
www.eaglehill.us/jona

Hysteriaceae & Mytiliniaceae — Website relating to the taxonomy of the Hysteriaceae & Mytiliniaceae (Pleosporomycetidae, Dothideomycetes, Ascomycota) to facilitate species identification using a set of updated and revised keys based on those first published by Hans Zogg in 1962. 59(4)
<http://www.eboehm.com/>

Index of Fungi
www.indexfungorum.org/names/names.asp

Interactive Key to *Hypocreales* of Southeastern United States (57-2)
nt.ars-grin.gov/sbmlweb/fungi/keydata.cfm

ISHAM: the International Society for Human and Animal Mycology
www.isham.org

JSTOR (58-3)
jstor.org

Libri Fungorum Mycological Publications (58-3)
194.203.77.76/LibriFungorum/

Mold Testing and Identification Services (58-2)
www.pioneer.net/~microbe/abbeylab.html

McCrone Research Institute (McRI) is an internationally recognized not-for-profit educational institute specializing primarily in teaching applied microscopy. 59(4)
www.mcri.org

Mountain Justice Summer (58-3)
www.MountainJusticeSummer.org

Mycology Education Mart where all relevant mycology courses can be posted. www2.bio.ku.dk/mycology/courses/

MycKey
www.mycology.com

The Myconet Classification of the Ascomycota
www.fieldmuseum.org/myconet

Northeast Mycological Federation (NEMF) foray database (58-2)
www.nemfdata.org

Pacific Northwest Fungi — A peer-reviewed online journal for information on fungal natural history in the Pacific Northwest (Alaska, British Columbia, Idaho, Montana, Oregon and Washington), including taxonomy, nomenclature, ecology, and biogeography.
www.pnwfungi.org/

Pleurotus spp.
www.oystermushrooms.net

Rare, Endangered or Under-recorded Fungi in Ukraine (56-2)
www.cybertruffle.org.uk/redlists/index.htm

Registry of Mushrooms in Art
members.cox.net/mushroomsinart/

Robigalia provides information about field observations, published records and reference collection specimens of fungi and their associated organisms, with access to over 685,000 records (59-3).
www.cybertruffle.org.uk/robigalia

Searchable database of culture collection of wood decay fungi (56-6)
www.fpl.fs.fed.us/rwu4501/index.html

Small Things Considered.
A microbe blog on microbes in general, but carries occasional pieces specifically on fungi.
schaechter.asmblog.org/schaechter/

Species of Glomeromycota Website (55-3)
www.amf-phylogeny.com

Tree canopy biodiversity project University of Central Missouri (58-4)
faculty.cmsu.edu/myxo/

Tripartite Similarity Calculator (55-1)
www.amanitabear.com/similarity

The TRTC Fungarium (58-1)
bbc.botany.utoronto.ca/ROM/TRTCFungarium/home.php

U.S. National Fungus Collections (BPI)
Complete Mushroom Specimen Database (57-1)
www.ars.usda.gov/ba/psi/sbml

Valhalla provides information about mycologists of the past, with names, dates of birth and death and, in some cases, biographies and/or portraits (59-3).
www.cybertruffle.org.uk/valhalla

Website for the mycological journal *Mycena* (56-2)
www.mycena.org/index.htm

Wild Mushrooms From Tokyo
www.ne.jp/asahi/mushroom/tokyo/

CALENDAR OF EVENTS

NOTE TO MEMBERS:

Those wishing to list upcoming mycological courses, workshops, conventions, symposia, and forays in the Calendar of Events should include complete postal/electronic addresses and submit to *Inoculum* editor Jinx Campbell at jinx.campbell@usm.edu.

August 16-20, 2009

The Society for Invertebrate Pathology 42nd Annual Meeting

Canyons Resort, Park City, Utah
www.utahSIP.org

September 20-25, 2009

X National Congress of Mycology of Mexico

Guadalajara, Jalisco, Mexico
www.cucba.udg.mx/micologia

October 23-November 1, 2009

XIII Latin American Marine Sciences Congress

Havana, Cuba
www.ecocubaexchange.org

October 26-30, 2009

Fungal Conservation: science, infrastructure and politics, a special international meeting

Whitby, North Yorkshire, UK.
www.cybertruffle.org.uk/whitbymycosynod

November 15-19, 2009

Asian Mycological Congress (AMC2009) & XIth International Marine and Fresh- water Mycology Symposium (IMFMS)

National Museum of Natural Science,
Taichung, Taiwan
www.amc2009.tw

November 26-29, 2009

NAMA/GSMS Foray

Lafayette, LA
www.namyco.org
www.gsmyco.org

December 6-10, 2009

X International Fungal Biology Conference

Ensenada, Mexico
www.funguscongress.ucr.edu

2010 MSA Meeting

University of Kentucky
Lexington, KY, USA

2010 IMC9

9th International Mycological Congress

Edinburgh, UK
www.imc9.info/

2011 MSA Meeting

University of Alaska
Fairbanks, AK, USA

2011 UMS Congresses

XIII International Congress of Mycology Sapporo, Japan

REMINDER: MSA Directory Update

Is your information up-to-date in the MSA directory? The Society is relying more and more on email to bring you the latest MSA news, awards announcements and other timely information, and our newsletter. To ensure that you receive Society blast emails and the *Inoculum* as soon as it comes out, and so that your colleagues can keep in touch, please check the accuracy of your email address and contact information in the online directory. This can be accessed via our web site at www.msafungi.org. If you need assistance with updating your membership information, or help with your membership log-in ID and password, please contact Kay Rose, Association Manager at Allen Press, at krose@allenpress.com.

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Jinx Campbell, Editor
Dept. of Coastal Sciences,
Gulf Coast Research Lab
University of Southern Mississippi
703 East Beach Drive
Ocean Springs, MS 39564
(228) 818-8878 Fax: (228) 872-4264
jinx.campbell@usm.edu

MSA Officers

President, Roy Halling
The New York Botanical Garden
The Bronx, NY 10458-5126
Phone: (718) 817-8613
Fax: (718) 817-8648
rhalling@nybg.org

President-Elect, Rytas Vilgalys
Biology Department
Duke University
Durham, NC 27708-0338
Phone: (919) 660-7361
Fax: (919) 660-7293
fungi@duke.edu

Vice President, Thomas Bruns
Department of Plant and Micro Biology
University of California
Berkeley, CA 94720
Phone: (510) 642-7987
Fax: (510) 642-4995
boletus@socrates.berkeley.edu

Secretary, M. Catherine Aime
Dept. of Plant Pathology and Crop Physiology
Louisiana State University AgCenter
Baton Rouge, LA 70803
Phone: (225) 578-1383
Fax: (225) 578-1415
maime@agcenter.lsu.edu

Treasurer, Sabine Hundorf
Department of Botany
The Field Museum
Chicago, IL 60605-2496
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___ **Ecology – Pathology** (including phytopathology, medical mycology, symbiotic associations, saprobic relationships and community structure/dynamics)

___ **Genetics – Molecular Biology** (including transmission, population and molecular genetics and molecular mechanisms of gene expression)

___ **Systematics – Evolution** (including taxonomy, comparative morphology molecular systematics, phylogenetic inference, and population biology)

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