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Deadline for submission to *Inoculum* 61(1)

December 6-10, 2009

X International Fungal Biology Conference
Ensenada, Mexico

February 15-19, 2010

Gondwanic Connections in Fungi Symposium
Bariloche, Argentina

June 28-July 1, 2010

MSA Meeting
University of Kentucky
Lexington, KY, USA

August 1-6, 2010

9th International Mycological Congress
Edinburgh, UK

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A simple and rapid method to determine vegetative compatibility groups in fungi

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Michael J. Wingfield[†] and Brenda D. Wingfield[†]

Vegetative compatibility in fungi reflects phenotypic differences (or similarity) among individuals representing the population of a species (Leslie 1993). Thus, individuals (genotypes) of a fungal species having the same heterokaryon (*het*) or vegetative incompatibility (*vic*) loci can fuse to form a heterokaryon (Glass et al 2000). Fungal isolates that form stable heterokaryons are then considered to belong to same vegetative compatible group (VCG). In contrast, isolates that are different at one or some or more of these loci will not anastomose. Rather, programmed cell death or apoptosis occurs in the mycelial cells that are in contact with an isolate representing a different VCG (Anagnostakis 1987, Leslie 1993). In the case of fungi which have coloured or dark mycelium in culture (such as most *Botryosphaeriaceae* and *Cryphonectriaceae*) failure to anastomose is observed as a thick barrage line between the two different isolates. For such species, tests in Petri dishes make it relatively easy to determine the VCG's for a population of isolates and this provides a robust view of population diversity (Burgess et al 2001, van Heerden and Wingfield 2001). For fungi with light coloured mycelium, for example species of *Fusarium*, barrage zones between isolates having different VCG's are difficult to discern. In such cases, it is necessary to produce *nit* mutants to define the individuals in culture (Klittich and Leslie 1988, Swift 2002).

Where it is possible to define the VCG's of individuals in the population of fungi, such tests are relatively simple and inexpensive. This approach also provides a means of understanding the genetic diversity in a fungal population where molecular markers and the concomitant sophisticated facilities may not be readily available. A disadvantage of determining VCG's in culture is that it is necessary to challenge every strain with every other strain in a population. This can be extremely time consuming and laborious. For example, where only two isolates are tested per Petri dish and there are 10 isolates in the collection to be studied, a total of 45 comparisons will be needed. An obvi-

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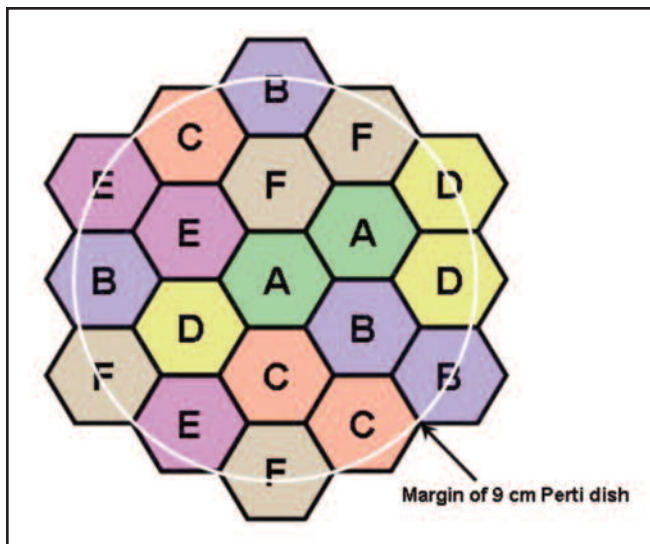


Figure 1. Template in which six isolates (A-F) can be compared on a single plate including control pairings where each isolate is compared with itself. A small mycelium plug (1 mm²) is placed in the centre of each hexagon

ous solution to the problem is to compare as many isolates as possible on a single Petri dish.

In order to increase the efficiency of VCG tests on Petri dishes, we have designed a template (Fig 1) where six isolates can be paired in all possible combinations on a single 9 cm Petri dish. This template has been used extensively (Smith et al 1996, Smith et al 2000, van Heerden and Wingfield 2001). A pairing schedule was then developed using this template to show how 31 isolates can be compared in all possible combinations in only 31 Petri dishes (Table 1) (Burgess et al 2001).

The pairing schedule described here to optimise VCG tests in culture, was originally derived empirically. Interestingly, however, it actually represents a specific block design known as a Steiner system. The design also represents a projective plane since every two plates have exactly one isolate in common (van Lint and Wilson, 2001). Thirty-one isolates appears to be an ideal number, and if any additional isolates are added to a study, the number of plates required for the tests would increase dramatically. For larger populations we suggest first comparing isolates in groups of 31 and thereafter, once duplicate VCG's are noted and removed, to compare the full population. For smaller populations we suggest duplicating some of the isolates to make up the set of 31. This approach will improve the speed, efficiency and reproducibility of vegetative compatibility tests.

Acknowledgements

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References

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Table 1. The pairing schedule for 31 isolates in which each isolate is paired with itself and all other isolates in 31 Petri dishes.¹

Plate no.	Position on template					
	A	B	C	D	E	F
1	1	2	3	4	5	6
2	1	7	8	9	10	11
3	1	12	13	14	15	16
4	1	17	18	19	20	21
5	1	22	23	24	25	26
6	1	27	28	29	30	31
7	2	7	12	17	22	27
8	2	8	13	18	23	28
9	2	9	14	19	24	29
10	2	10	15	20	25	30
11	2	11	16	21	26	31
12	3	7	13	19	25	31
13	3	8	14	20	26	27
14	3	9	15	21	22	28
15	3	10	16	17	23	29
16	3	11	12	18	24	30
17	4	7	14	21	23	30
18	4	8	15	17	24	31
19	4	9	16	18	25	27
20	4	10	12	19	26	28
21	4	11	13	20	22	29
22	5	7	15	18	26	29
23	5	8	16	19	22	30
24	5	9	12	20	23	31
25	5	10	13	21	24	27
26	5	11	14	17	25	28
27	6	7	16	20	24	28
28	6	8	12	21	25	29
29	6	9	13	17	26	30
30	6	10	14	18	22	31
31	6	11	15	19	23	27

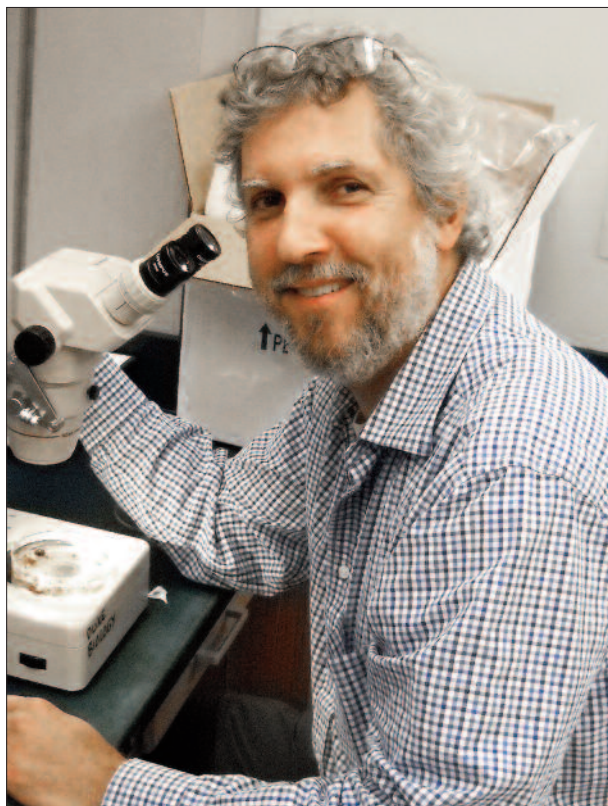
¹This design allows for cross checking (*i.e.*, if isolate 1 has same VCG as isolate 11 and isolate 25 then isolate 11 and 25 should also be compatible).

MSA BUSINESS

From the President's Corner . . .

Greetings from Durham, North Carolina, where we are having a great mushroom season- after 20 plus years we are still finding new species right here in the Duke Forest. This is my first column as MSA president, so I thought I might give you a little information about myself. My Lithuanian ancestry explains a lot about my fondness for fungi- I first learned to hunt edible mushrooms with my grandmother during summers in the north-eastern US and Canada. In high school, I learned formal mushroom identification from ardent amateur mycologist and NAMA activist **Marge Morris**. In college, I had the good fortune of having a mycologist **John Clausz** as my advisor at the SUNY College at Geneseo. John recommended that I join the MSA back when a student membership cost only 5 bucks! John also recommended that I pursue graduate school with **Orson K. Miller** at VPI in Blacksburg, VA. I earned both M.S. and Ph.D. with Dr. Miller working on mating biology and molecular systematics of agarics. In 1985, I worked as a postdoc with **Amy Rossman** at the National Fungus Collections in Beltsville, MD, before landing my current position at Duke University. My lab group at Duke still uses molecular approaches to study fungal natural history at a variety of levels ranging from populations to species and communities.

I recently returned from a 6 month sabbatical in Canberra, Australia, where I had a chance to learn something about Australian agro-ecology. Australia is a mecca for mycology, and Liz and I had many excellent opportunities to travel in Queensland, the Northern Territory and even Western Australia. My first stop after Australia was this year's joint MSA/BSA meeting in Snowbird, Utah, where I received the gavel from past-president **Roy Halling**. Roy was one of my early mycological mentors who taught me the nuances of small white-spored agarics when I was a beginner grad student. Roy has traveled everywhere in the world to collect fungi, and his experience is only exceeded by his dedication to serving the mycological community. I am deeply grateful to Roy for his service as president this past year. I'd also like



Rytas Vilgalys, President

to thank this past year's **Program Chair Marc Cubeta** for putting together a well-integrated program together with our botanist colleagues from the BSA.

There's always a lot happening behind the scenes at MSA- unlike larger societies, we are a 100% volunteer-driven organization. Our meetings, our journal, everything comes from our membership. Right now, I am nearly finished appointing members to our various MSA rotating committees. I'm very pleased to report that **Jinx Campbell** has agreed to serve another term as editor of our society newsletter *Inoculum*. Thanks, Jinx! If you haven't volunteered to serve on a rotating committee, please let me know-we'll find a way for you to serve!

Don't forget to make your plans now for next summer's joint Meeting of the Mycological Society of Amer-

ica (MSA) with the International Symposium on Fungal Endophytes of Grasses (**ISFEG**), in Lexington, Kentucky on June 28-July 1, 2010. Our hosts for MSA2010, Chris Schardl and Lisa Vaillencourt, are planning to give us a real taste of what life is like in the home of the Kentucky Derby. MSA Program Chair **Tom Horton** has developed the theme of "Symbiosis" for next year's meeting, and is still actively soliciting ideas for symposia. I shall look forward to seeing many of you in Kentucky!

Another important event next summer is the 9th International Mycological Congress, which will take place in Edinburgh, Scotland, from 1-6 August, 2010. IMC9 is being hosted by the British Mycological Society with the broad theme of "Biology of Fungi", and chief organizer **Nick Read** promises a memorable meeting including a "final banquet to top all final banquets". The list of symposia looks especially impressive. I strongly urge MSA members to participate in this next IMC!

Speaking of Congresses, the MSA is preparing a bid, together with Puerto Rican Mycological Society president **Sharon Cantrell**, for hosting the 10th International Mycological Congress in San Juan, Puerto Rico in 2014. Our bid

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is due in February, and we will hear about its success sometime later next summer. Let's keep our fingers crossed!

In upcoming columns, I hope to highlight many of the great things happening in the MSA. I also plan to discuss some of the difficult issues which face our society, including the recent recession which has affected all of us. Some of the most exciting changes are happening to our society journal *Mycologia*, where Editor-in-Chief **Jeff Stone** and his associ-

ate editors (100% volunteers) have worked tirelessly to reduce the review time for submitted articles. Jeff also recently instituted a new mechanism for expedited publication of high-profile papers in *Mycologia*. I'll be very interested to hear about your ideas for the coming new year. Best wishes to all.

—**Rytas Vilgalys**
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MSA Secretary's Email Express

MSA Council has completed one email poll since my last report, approving the following:

- MSA Full Council poll 2009-10-01: MSA council approved the nominee selected by the Karling Annual Lecture Committee, chaired by **Dr. Daniel Durall**, to give the 2010 Karling Annual Lecture.

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 Lexington, KY in 2009.

United States: Xiaodong Bao, Joshua M Birkebak, Claire Burns, Thomas Davis, Jessica Gibson, Trevor Miles Herrick, Robert Johnson, Amy Karpatti, Kevin Andrew Kuehn, Robert Karl Luecking, Wenying Wu

Denmark: Anja Amtoft Wynns

Canada: Tristan Iafolla

Emeritus candidates: Dr. A. J. Meyers of Kingsport, TN has applied for emeritus status. 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 death of Dr. Lois Tiffany on Sept. 6, 2009. Dr. Tiffany was a Distinguished



Jessie Glaeser, Secretary
(Photo by Tom Volk)

Professor of Botany (now Ecology, Evolution and Organismal Biology) at Iowa State University. She served on a number of MSA committees and was the recipient of the very first Weston Award. She will be missed by her friends and collaborators in the Society.

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 our Association Manager at Allen Press, the always-helpful Kay Rose at krose@allenpress.com.

Please do not hesitate to contact me about MSA Business or any questions that you may have about the Society.

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Affiliated Mycological Societies – Regional

Boston Mycological Club (**BMC**)
Illinois Mycological Association (**IMA**)
Oregon Mycological Society (**OMS**)

Allied/Sister Mycological Societies – National & International

African Mycological Association
Australasian Mycological Society
British Mycological Society (**BMS**)
Latin American Mycological Society (**ALM**)
Mycological Society of China (**MSC**)
Mycological Society of Japan (**MSJ**)
North American Mycological Association
(**NAMA**)

Honorary Societies & Institutes

British Mycological Society
Centraalbureau voor Schimmelcultures
(**CBS**) 2004
Mycological Society of Japan 2005

MYCOLOGICAL NEWS

International Fungal Conservation Conference

The first international conference on the conservation of fungi, organized on behalf of the International Union for Conservation of Nature (IUCN) www.iucn.org/-about/work/programmes/species/about_ssc/, was held in Whitby, UK 26-30 October 2009. Over 30 participants representing 20 countries from Europe, Africa, Asia, Australasia and the Americas gathered in this small seaport town on the northeast coast of England to help set the agenda for global efforts towards conserving fungi and to identify some of the impediments standing in the ways of advancing fungal conservation. The event was organized and led by David Minter under the auspices of the European Mycological Association on behalf of the International Union for Conservation of Nature, with support from the UK Darwin Initiative (DEFRA) and the Mohamed bin Zayed Species Conservation Fund.

An important outcome of this conference was the decision to establish a global federation of fungal conservation groups. The federation would facilitate the efforts of regional and national conservation committees, e.g., the MSA Committee for Fungal Conservation, by fostering communication among groups and enhancing synergies. A steering committee of five mycologists was appointed to help establish the federation. The five mycologists are: Peter Buchanan (New Zealand), Marieka Gryzenhout (South Africa), David Minter (UK), Greg Mueller (USA), Tatyana Svetasheva (Russia). As Chairman of the Organizing Committee of the special IUCN conservation conference, David Minter was asked to co-ordinate the work of this committee.

This conference is the latest in a series of important milestones in efforts to move fungal conservation forward at local to international scales. For example, the formation of a MSA Conservation Committee in 2008 has had important international repercussions. The MSA committee has been used as an example of the growing awareness for the need to focus attention and action on fungal conservation. The establishment of the MSA Conservation Committee was successfully used as part of the argument for establishing a Latin American Conservation Committee during last year's Latin American Mycological Association meeting and as part of the justification for reorganizing the way fungi are treated by the IUCN.

Due in large part to David Minter's cogent arguments and persistence, and with the strong support of Simon Stuart, Chair of IUCN Species Survival Commission, and others, Fungi are now recognized by IUCN as a lineage worthy of conservation independent of Plants. This has many important implications for fungal conservation. One of which was the opportunity to expand the number of Specialist Groups focused on fungi. So now, rather than two groups (Fungi and Lichens) there are five Specialist Groups. Chairs of each of the groups are now forming their committees.

IUCN SSC Lichen Specialist Group, Chair: Christoph Scheidegger christoph.scheidegger@wsl.ch



IUCN SSC Rusts and Smuts Specialist Group, Chair: Cvetomir M. Denchev cmdenchev@yahoo.co.uk

IUCN SSC Cup-fungi, Truffles and their Allies Specialist Group, Chair: David Minter d.minter@cabi.org

IUCN SSC Chytrids, Zygomycetes, Downy Mildews, Slime Moulds Specialist Group, Chair: Mayra Camino Vilaro mcamino@fbio.uh.cu

IUCN SSC Mushrooms, Brackets and Puffballs Specialist Group, Chair: Gregory Mueller gmueller@chicagobotanic.org

Changes at IUCN, formation of national and regional conservation committees, and creation of the global federation of fungal conservation groups, etc. are all wonderful and important steps in efforts to conserve fungi. But they are just steps. To be successful we need to engage and energize the mycological community, both professional and amateurs, to undertake research, develop conservation strategies, work with policy makers to strengthen protection, and raise public awareness for the need of trained mycologists and the vital ecological and economic role of fungi.

—Greg Mueller
gmueller@chicagobotanic.org

Rob Samson Receives Honorary Doctorate in Uppsala

The Swedish University of Agricultural Sciences (SLU) in Uppsala conferred Rob Samson the degree of Honorary Doctor of Agricultural Sciences at the Faculty for Natural Resources and Agricultural Sciences.

The Faculty's motivation was as follows: Dr Rob Samson, CBS - KNAW, Utrecht, the Netherlands is a world leading specialist on the taxonomy of *Aspergillus* and *Penicillium* species. Some of these fungi occur as spoilage organisms and potential mycotoxin producers in food and feed. Other species have important roles in the biotech industry, while still others are used in the production of mould-fermented foods (roquefort and camembert cheese, salami and soya sauce). A correct identification to species level is essential for both food safety and industrial process quality. Dr Samson has developed stable taxonomic systems based on morphological, chemi-



cal and molecular criteria that are fundamental to fungal identification. His basic research in fungal taxonomy has led to studies of *Aspergillus* and *Penicillium* in relation to food, biotechnology, indoor air quality and medicine. Dr Samson has organised international courses on "Identification of food- and airborne fungi" with numerous SLU participants. He has also written richly illustrated textbooks that are used by hundreds of SLU students every year. In conclusion Dr Samson's research and pedagogic skills are of excellent international

Standard, which has been and will be of large and central importance for the faculty.

The ceremony at the Swedish university took place on October 3 2009, where Dr Samson received the traditional doctor's hat, ring and diploma.

NAMA Speakers' Bureau

If we want to make a case for conservation of fungi, we have to educate the general public, and spread the word about mushrooms.

The North American Mycological Association (NAMA) is the umbrella organization for 60 plus local and regional mushroom clubs throughout the country. NAMA organizes an annual foray at some beautiful place in North America, issues a journal, *McIlvainea*, now online at www.namyco.org/publications/mcil_journal.html and a newsletter, *Mycophile*, has a lot of educational material and keeps track of mushroom poison cases.

It also has a speakers bureau: a list of mycologists, both amateurs and professionals, who are ready to talk about their favorite subject to non-scientists (www.namyco.org/education/speakers_bureau.html). Many MSA members have signed up and are available for talks.

Are you doing fascinating research – and who does not –, would you or your students, like to share your enthusiasm for your research and research objects, or would you love to foray in unknown territory or share your favorite woods with fellow-mycophilists, sign up for the speakers' list by emailing Michael Beug at beugm@evergreen.edu.

—Else C Vellinga

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MSA Committee Liaison with Amateur Mycologists

Dr. Lois Tiffany



With sadness, the Memorials Committee reports the death of Dr Lois Tiffany, a long and distinguished member of MSA. Lois served the Society in several capacities and supervised an admirable list of Ph.D. and master's degree students. Dr Maren Klich has consented to compile a memorial for *Mycologia*, and other associates of Dr Tiffany are welcome to contribute anecdotal testimony.

—Ron Petersen

Chair, Memorials Committee
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Medicinal Mushroom Workshop

Cultivating the Anti-Cancer Mushrooms: Ling Zhi (*Ganoderma lucidum*), Chong Cao (*Cordyceps sinensis*) and Yong Chong Cao (*Cordyceps militaris*).

Mo-Mei Chen. March 26-28, 2010. Location: Valley Life Sciences Building, UC Berkeley, Berkeley, CA

This special three-day, hands on mushroom workshop will introduce participants to the medicinal fungi studies of Lin Zhi (*Ganoderma lucidum*), Chong Cao (*Cordyceps sinensis*), and Yong Chong Cao (*Cordyceps militaris*) and teach participants how to set up a medicinal farm at home. Mo-mei's new book, "Fungi Treasures" will be used to learn how to identify edible mushroom species, especially the medicinally useful and cultivable: *Agrocybe*, *Cordyceps*, *Lentinula*, *Hericium*, *Ganoderma*, *Fomitopsis*, *Pleurotus* and *Tremella*. In the laboratory, the focus will be spawn techniques, media preparation, appropriate environmental condi-

tions essential for spawn growth, and isolation and inoculation methods. The first day will focus on Ling Zhi cultivation and the second on Yong Chong Cao. Each participant will produce a Ling Zhi kit to take home for incubation and personal harvest. On the third day, participants will have the opportunity to take a guided visit of the retail and distribution center of herbs and medicinal fungi in San Francisco's Chinatown to study farmed and medicinal fungi and herbs in a market place setting.

Course fee \$285/\$310. The course fee includes a delicious mushroom lunch on Saturday.

—**Cecile Shohet**
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Triumph of the Undead

Hello MSA colleagues, Back a few years ago, when you held your annual meeting at the University of North Carolina, Asheville, I was your invited keynote speaker per the kindness of Dr. Harold Keller. If you recall, I spoke about forest canopy ecology, the "High Frontier."

I've since moved into the Roanoke Valley of Virginia from the Gulf Coast of Florida, teaching and writing about the natural history of the region. One of my recent columns in the *Roanoke Star-Sentinel*, entitled "Triumph of the Undead," fo-

cused on mycoflora: <http://newsroanoke.com/?p=3201>. I thought you might enjoy reading it!

Warm regards to all your members!

—**Bruce Rinker**
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MYCOLOGIST'S BOOKSHELF

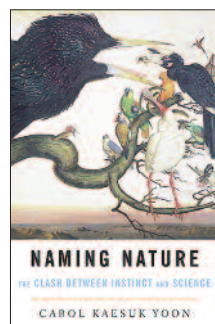
Seven books are reviewed in this issue. Twelve new books are listed since the last Mycologist's Bookshelf although many have yet to be received from the publishers. If you know of a newly published book that might be of interest to mycologists, please let me know so that I can request it from the publisher. Look especially for books that state review needed, then email me if you would like to review it.

Amy.Rossman@ars.usda.gov

Naming Nature: The Clash Between Instinct and Science

Naming Nature: The Clash Between Instinct and Science. 2009. Carol Kaesuk Yoon. W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, NY 10110, <http://www.wwnorton.com>. ISBN 978-0-393-06197-0. 344 pp. Price: \$29.95.

Brilliant! Accessible! Required Reading! These are the terms that immediately come to mind after reading Carol Kaesuk Yoon's comprehensive



study of how all of us are taxonomists from birth. We are the folk taxonomists of our cultures. Here she illuminates how professional taxonomists have grappled with the naming of the world's living and fossil entities.

During the years of 1951–1996 in which I chaired the Ph.D. graduate committees of over 20 students, there was one seminal paper I considered required reading for all my students doing taxonomic studies, namely C. C. G. J. van Steenis's *Specific and infraspecific delimitation* Flora Malayesiana, ser. 1, 5(3): clxvii-ccxxxiv.1957. This book,

Continued on following page

Naming Nature, would be the second required reading had I students today.

The reader will discover almost immediately that she/he may need to add a new word to her/his active vocabulary: **umwelt**, originally German for “the environment,” but in ethology “the perceived world as it is experienced by a particular organism,” in this case, the human umwelt. Explanation after explanation in the book requires the reader to use this term in understanding the principles the author addresses.

If you thought you knew all you needed to know about Linnaeus, Darwin, the development of binomial nomenclature and the origin of species, you will learn (as I did) little known facts and foibles of such men. But you will also be led to understand the incredible turmoil in taxonomy from the 1940’s to date.

Our morphology-based species concepts, in some primitive folk taxonomies almost exactly mirroring professional taxonomists’ results, were the basis of all our taxonomy, used by everyone for nearly 200 years, as much an art as a science. Suddenly we were assaulted by an astonishing array of new technologies that questioned those intuitive taxonomic decisions. Julian Huxley’s 1940 *The New Systematics* was but the beginning. Next arrived numerical taxonomy. In the 1950s and 1960s Michener & Sokol, Sokol & Sneath proved that mathematics could use arbitrary unweighted characters to come up with a taxonomic arrangement similar to that deduced by professional taxonomists. Chemical studies of proteins in the 1960s by Zuckerkandl & Pauling, Margoliash & Fitch, among others, issued in a new approach, taxonomy through chemistry, the molecular evolutionary clock, and the world of molecular taxonomy. (An aside here: the chemical “taxonomy” of lichenologists, not addressed in the book, is another ball of wax, providing few insights.) Waves of new terms, new approaches, and new techniques came with rapid-fire change upon change. The eminent Ernst Mayr, bird taxonomist of

the American Museum of Natural History in New York, spent much of his energy vainly attempting to discredit many of the methodologies and the truths that scientific research provided. Those truths lay in DNA sequencing, restriction enzymes, gels and gel-jockeys, RNA, PCR, RFLPs, Willi Hennig’s 1950 cladistics—overlooked for decades, clades, synapomorphies, autapomorphies, sympleisiomorphies, biological species concepts, cryptic species, r values, maximum likelihood, Bayesian analysis, evolutionary trees of all life, and a single failure, the ill-fated PhyloCode.

One chapter, *The death of the fish*, is particularly engaging, using as its example the folk-taxonomy term “fish,” no longer justified by scientific truth (cladistics). What we have been calling fish defies evolutionary history when we discover that lungfish are closer to cows than to the rest of the fishes. To continue to recognize fish as a valid taxonomic group we will need to thumb our noses at scientific taxonomy and go back to embracing whales as fish, which indeed Linnaeus did in his first edition of *Systema Naturae*. It doesn’t stop there, of course. As the author points out, we lose moths, zebras, and many other parts of the human umwelt to cladistic truth.

In conclusion, I can only insist that no matter how you view taxonomy, this book will provide you joy and insights. “Recommended reading” is too weak. “Essential reading” fits this astonishingly easy-to-read unraveling of the taxonomic process. It is as valuable to the amateur taxonomist, nature lover, or bird watcher as it is to the professional. Rather than considering taxonomy to be irrelevant, as is so often the case, I suggest, along with the author, that it is something to be wildly enthusiastic about.

—Richard P. Korf

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Fungi in Biogeochemical Cycles

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.

This wonderful, international multi-authored volume by Gadd and associates synthesizes the increasingly popular field of fungal transformation of inorganic Earth materials, be they man-made or soil-derived, with updates from the frontier of the carbon, nitrogen and water cycles. Several chapters on soil mineral transformations and oxalotrophy suggest new experiments



for my research while others caught my eye as under-appreciated areas, namely freshwater fungi, lichen biogeochemistry, and cave-dwelling fungi. All scientists involved in the study of life in extreme environments, paleo-ecology, and weathering processes, e.g. the new NSF consortium CZEN – *Critical Zone Exploration Network*, will find delight in this book. Regrettably, perhaps the only mycologists who will not find this book of interest are those with strictly evolutionary and ethnomycologic interests. Soil ecology and biogeochemistry classes for advanced undergrads and graduate students can profitably add this book to their reading lists.

—Ted K. Raab

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Ecological Impacts of Non-Native Invertebrates and Fungi. . .

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.



This collection of papers aims to address the deficit of information on invasions by two understudied and hyper-diverse groups of organisms, invertebrates and fungi. The papers in this volume resulted from a 2006 symposium on *Ecological impacts of non-native invertebrates and fungi on terrestrial ecosystems* and have been reprinted from *Biological Invasions* 11(1). The focus of most papers is North America, with an emphasis on Canadian studies.

The papers collected in this volume are well written and represent a substantial body of information, much of which was previously available only in gray literature and often difficult to access. The focus of most papers is arthropods with three review papers and three case studies focusing on insect invasions. One paper reviews non-native earthworms and two review invasions by fungi. A final paper addresses successes in management of non-native species at the global level. That these papers would be collected together seemed strange initially, but after reading them as a group it is clear these diverse taxa share many characteristics that make them difficult to study. For all of these taxa, difficulties in species identification and incomplete knowledge of the species pool make it difficult to distinguish invaders from native species. Similarly, it is difficult to quantify the impacts of invasive fungi and many invertebrates. Studies of the ecological effects of invaders in both groups are just beginning to address the many direct and indirect ways that invasive species can impact the ecology of an invaded system.

The introduction by Langor and Sweeney outlines the organization of the book and papers by Langor et al., Kenis et al., and Parry review the diversity of non-native arthropods in Canada, the ecological effects of alien insects, and non-target effects of parasitoids. As for fungi, most papers examining ecological effects of introduced arthropods concern a few taxa that are economically important and may not be generalizable to other species.

Addison reviews earthworm invasions in Canada and touches briefly on the variety of ways in which invasive earthworms can alter forest ecosystems via their effects on soils. Little mention is made of how earthworms affect soil microbial communities, but Addison acknowledges that much more research is needed in this area.

Of more direct interest to mycologists are the two papers on fungi by Loo and Rossman. The paper by Loo provides a succinct qualitative description of the effects of seven major introduced fungal pathogens in North America, while noting that many other introduced fungi may have had less obvious impacts on ecosystems. Quantification of fungal effects beyond direct effects on trees is hampered by lack of baseline information on fungal communities and the ecological roles of native species.

The paper by Rossman provides a concise summary of the impact of introduced fungi in agricultural systems. Agricultural invaders have received more attention than invaders of natural systems, yet difficulties in identification of these hyper-diverse taxa remain prominent, even in these relatively well-studied systems. This makes a strong case for increased research on native species, as well as on management of introduced species, so new invasions can be prevented, detected early, and effectively managed.

The case studies of invasive insects by Dosdall et al., Olfert et al., and Régnière et al. summarize management efforts for two agricultural and one forest insect invader. In each case, multi-pronged approaches were used with varying degrees of success.

The final paper by Simberloff summarizes projects that have resulted in successful management of invasive species, rightly pointing out that management failures receive far more attention than successes. He goes on to outline five characteristics of successful management projects that should inform future management efforts.

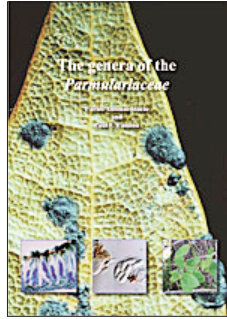
Clearly, many fungi beyond the seven reviewed by Loo have been in the past and are now being introduced around the world. As attention in the mycological community increasingly turns to fungal invaders, we can learn from studies of other taxa that are similarly diverse and often cryptic. To that end, this collection of papers will be quite useful to mycologists interested in non-native fungi.

An important research need in each of these taxonomic groups is clearly a better assessment of the native diversity and a better understanding of ecological and phylogenetic relationships between taxa. Without this information it will remain very difficult to prevent, detect, or manage invasions. As the quantification and identification of fungal communities is currently hotly pursued by researchers using advanced molecular techniques, this is a point worth emphasizing. This book provides a concise collection of studies of invasion by species in hyper-diverse groups and should be informative for both managers and researchers concerned with invasive species.

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The Genera of the Parmulariaceae

The genera of the Parmulariaceae. 2008. CA Inácio, PF Cannon. CBS Biodiversity Series No. 8. CBS Fungal Biodiversity Centre, Utrecht, The Netherlands. www.cbs.knaw.nl. ISBN 978-90-70351-72-4, hardbound, 196 pp. Price: € 65.



This outstanding volume is one of the first attempts to gather all information about a poorly known group of tropical plant parasitic ascomycetes. The Parmulariaceae are small, inconspicuous leaf pathogens with superficial shield or crust-like ascomata connected to internal hyphae or stromata. They produce bitunicate asci with mostly 2-celled, brown ascospores. On the basis of morphological data, the family is traditionally assigned to the Dothideomycetes. In this hardcover book copiously illustrated with 111 pictures including 15 coloured plates, Inácio and Cannon present a revised taxonomic concept of the family and introduce various taxonomic novelties next to the detailed compilation of the 34 accepted genera of the Parmulariaceae.

After a short historical overview to the family including various lists of geographical and host plant data, the most important morphological characters of the family are discussed in detail and compared with concepts of similar families. Accordingly, a revised dichotomous key to the genera of Parmulariaceae is presented with the 34 genera addressed in alphabetical order. Each taxon is presented with full nomenclatural citation, typification, history, morphology, ecology, host plants, geographical distribution, examined specimens, and additional notes. Some excluded genera and species with dubious status are discussed in detail afterwards.

One of the great achievements of this compilation is

the detailed revision and comparison of the type species of each genus, including the illustrations, both light microscopic photographs and line drawings, of type and/or typical material. Indispensable for the identification of genera of Parmulariaceae are the host index, detailed morphological and distributional data, and the location of available herbarium specimens. A nomenclatural checklist of Parmulariaceae is noteworthy, because it covers all hitherto accepted and unaccepted names of genera and species of the family. The extensive bibliographic index includes almost every important reference to the Parmulariaceae. The price is reasonable and justified considering that the overall existing literature is very sparse and often alarmingly out of date. Well-intentioned, but often slightly disappointing was the quality of the prepared light microscopic photographs of the ascomata in cross section, squeezed hymenia, and structures of host plant-infection. In many cases a well prepared line drawing would have been more informative.

In summary, this book provides an excellent identification manual and an invaluable source of background information on the Parmulariaceae for students and scientists of tropical plant pathology and mycology. Additionally, this compilation serves as a fundamental basis to urgently needed phylogenetic studies of the family, whose relationship within the Dothideomycetes is still unresolved. These biotrophic pathogens cannot be grown in culture thus DNA sequences must be obtained from living material. This emphasizes the importance of scientific interchange and education of tropical mycologists today. It is hoped that comparable qualitative studies of these barely known fungal groups will continue into the future in order to uncover the fascinating, but hidden diversity of tropical microfungi.

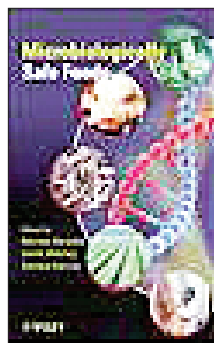
—Tina A. Hofmann

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Microbiologically Safe Foods

Microbiologically Safe Foods. 2009. Norma Heredia, Irene Wesley, Santo García (eds.). John Wiley and Sons, Inc., <http://www.wiley.com>. 667 pp. Price \$135.

Microbiologically Safe Foods is a comprehensive book that examines the microbes detrimental to foods, contamination prevention and detection as well as risk assessment, and good manufacturing practices in the food industry. This book contains 31 chapters with an additional list of contributors, preface, forward, and index. An introduction prefaces each chapter and is divided into sections containing a headline,



making it easy to change topics and find information. The end of each chapter also includes references, so one can easily find more information on a given topic. Many chapters also include tables depicting outbreaks of specific foods or flowcharts of where potential contamination could have occurred during manufacturing.

Introductory chapters address the specific microbes that contaminate food commodities and their impact on public health, whereas subsequent chapters address the prevention and control strategies for manufacturers. *Enterobacter sakazakii*, prion diseases, and avian influenza garnered their own chapters. Methods for detecting the microbes, laboratory accreditation and proficiency, bioterrorism, predictive microbiology, and genetically modified

Continued on following page

organisms are addressed towards the end of the book.

All food categories appear to be listed, even spices, herbs, chocolate, and sweeteners, which are often left out of books involving food-borne pathogens. The helminthes, acanthocephalans and algal biotoxins are addressed as contaminants of fish. The section on *Prevention and Control Strategies* is also very comprehensive in addressing risk assessment, sanitation, pest management, HACCP, preservation methods, and food packaging. Even detailed information on Standard Operating Procedures (SOPs) and how to handle food recalls are addressed.

For mycologists, this book focuses on mycotoxins in food, specifically on *Aspergillus* aflatoxins, and *Fusarium* and *Penicillium* toxins. Fumonisin, ochratoxin, patulin, T-2, zearalenone, and vomitoxin are emphasized. Chemical structures of toxins are depicted in chapter 15. Fungi are considered in foods such as raw citrus juices, frozen foods, spices and herbs, salad dressings, chocolate and cereals and grains. *Debaryomyces*, *Pichia*, *Torulopsis*, and *Zygosaccharomyces* are listed as contaminants of mayonnaise, salad dressings and acidic condiments. *Aspergillus*, *Candida*, *Chrysosporium*, *Kloeckera*, *Kluyveromyces*, *Penicillium*, *Pichia*, and *Saccharomyces* are discussed as contaminants of chocolate.

Although the book is comprehensive, a few microbes are not mentioned that easily could have been included. Bacterial contamination of beef specifically mentions *Campylobacter*, *Escherichia*, *Listeria* and

Salmonella, but the chapter does not list fungi, or parasites like *Taenia*. Chapter 7 addresses microbes in milk, but does not mention Q fever as a potential contaminant. Chapter 10 focuses on pork-bacterial pathogens and *Taenia*, *Toxoplasma*, and *Trichinella* are listed in one sentence. Since *Trichinella* can cause death, it could have been addressed in more detail. A couple of words are misspelled, such as *Toxoplasma* on page 14 and *Rhodococcus* on page 537.

The language is appropriate for a textbook at the undergraduate level with some microbiology background or as a reference book, and is a relatively easy read. Many chapters discuss the same characteristics about specific microbes, providing substantial redundancy. This would allow someone to read the individual chapters, rather than having to read the entire book to understand the material. Even though this book is a compilation of chapters written by different experts, the chapters, and the material within the chapters, seem to flow in a logical manner. The title of this book should have a subtitle as it can be interpreted as a book that talks about foods that would be microbiologically safe to eat, rather than a book for the food industry to make foods safe. Overall, this reference book would be a great addition to the bookshelves of researchers, students, and employees interested in food safety or in the food industry.

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Biodiversity and Ecology of Lichens

Biodiversity and Ecology of Lichens: Liber Amicorum Harrie Sipman. 2009. Andre Aptroot, Mark R.D. Seaward, 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.

In 1979, while working as a field assistant in the Dry Valleys of the Trans-Antarctic Mountains and suffering from bio-deprivation, I found a small, ca, 4 mm diameter, yellow lichen in a protected wind-eroded crevice in a dolerite boulder. I was so pleased to find it, I burned an entire roll of film taking its picture. Not until I read this volume did I have a sense of its probable identity: *Lecidia andersonii* or possibly *L. auriculata* or *L. promiscens*.

In celebration of his birthday and recognition of his formal academic retirement, the present volume comprised of 26 original scientific contributions was prepared to honor the eminent lichenologist Harrie Sipman. The majority of the papers range from checklists of lichens to ecology, biogeography and descriptions of new species and genera, and phylogenetic appraisals of several groups. The quality of the papers is generally high, attributable to both researchers' efforts and rigorous editorial standards. The papers of greatest interest to the non-specialist reader will be those surveying cryptothaline species (Hertel), the evo-

lution of cyanobacterial symbioses (Hognabba, Stenroos, Thell & Myllys) and effects of climate change and ammonia concentration on the distribution of lichens in the Netherlands (van Herk). However, no harm will come to anyone who reads the entire volume. Indeed, the methods described in several of the papers, closely read, could serve as a primer for current approaches to phylogenetic analyses. The usual suspects are all found – multigene reconstructions, parsimony and maximum likelihood analyses, bootstrapping and Bayesian post-hoc probabilities. One paper presents statistical support for phylogenetic trees using jack-knifing. There is a brief, fond biographical note about Sipman and one paper cataloguing liverworts and hornworts. The quality of the illustrations is very good to excellent. Several of the papers include color photographs showing thallus habit and, unlike many publications, the photomicrographs clearly illustrate the indicated features.

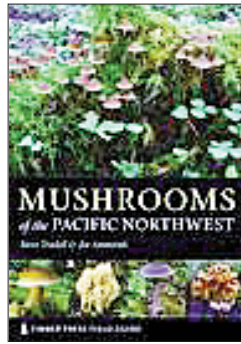
Oh! to be an epithet! - a fitting aspiration for any biologist. The last page of the volume, which follows a list of Sipman's papers through 2008, lists the two genera and 26 species that have been named in his honor.

—David Yohalem

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Mushrooms of the Pacific Northwest

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.



This well written book is a regional guide to macrofungi that is designed for use by people with a broad range of interests and skill in identifying fungi. It begins and ends, among other things, with the customary accoutrements of a basic introduction to fungi, collecting methods, fungal identification, and poisoning as well as a glossary that includes illustrations. Notably, the portions on ecology and conservation are more substantive than those of many similar guides.

The core of the work is the descriptions and color photographs of over 450 fungi. The authors stress that only a small percentage of the region's macrofungi are included so that beginners will realize that not everything can be named with the guide. Also, the authors warn that many taxa cannot be successfully identified based on field characters alone. The species are more or less grouped by the Friesian system and spore print color. There are a handful of basic keys to major groups and genera, but species identification requires a combination of picture matching followed by comparison to written descriptions. Overall, the quality of the color photographs is very good. As always, it would be better if they were larger. Instead of being long, detailed, and technical, the descriptions focus on salient diagnostic field characters using simple

terms. The ecology and edibility of taxa is emphasized. When necessary or useful for identification, microscopic characters are given. Similar species are often discussed and notes on taxonomic problems including some for future research are presented. The addressed species are chosen to be representative of the broad range of fungal diversity in the region and cover many common taxa. Mycologists will be pleased and probably not surprised that several locally diverse taxa including *Cortinarius* and *Ramaria* receive a more detailed treatment than other groups. The number of seldom to rarely illustrated taxa makes this work even more valuable.

The most current and correct name is more or less presented for each taxon. The use of generic names as common names, often plural, such as amanita, gymnopuses, and dasyphyces seems odd in print even though such practice is common among mycologists in informal settings. If I were to nitpick, I would not use the same symbol (=) for homotypic and heterotypic synonyms.

This work is a must have for anyone who wants to identify macrofungi of the Pacific Northwest, especially in the field as the authors' extensive knowledge of field mycology is capably passed on to readers. This book would make a good supplementary textbook for mycology classes in the region. Since many of the included taxa are found outside of the Pacific Northwest, this book will also be of value to collectors elsewhere in the U.S.A. Walt Sundberg often says, "as many as you can afford" to the question: which field guide or guides should I get? This sentiment definitely holds true for this field guide.

—Drew Minnis
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Recently Received Books

- ***Aspergillus: Molecular Biology and Genomics.*** 2010. Masayuki Machida, Katsuya Gomi (eds.). Caister Academic Press, Caister, Norfolk, UK, www.caister.com ISBN: 978-1-904455-53-0. Price: \$310.00. *Requested from publisher.*
- ***Atlas of Wood Decaying Fungi.*** 2009. Y. Stacheva, S. Bencheva, T. Pavlidis, M. Illeva. Pensof Publishers. ISBN-13: 978-9-546424-68-6. 349 pp. Price: £91.00. *Requested from publisher.*
- ***Checklist of the Lichens and Lichenicolous Fungi of Greece.*** 2009. Bernard F. Abbott. Available from Koeltz Scientific Books, koeltz@t-on-line.de Bibliotheca Lichenologica 103: 1-368. Price: Unknown. *Requested from publisher.*
- ***Diversity of Lichenology – Anniversary Volume.*** 2009. Arne Thell, Mark R.D. Seaward, Tassilo Feuerer (eds.). Schweizerbart'sche Verlagsbuchhandlung, <http://www.schweizerbart.de> ISBN 978-3-443-58079-7, Bibliotheca Lichenologica 100: 1-512. Price: €124. *Requested from publisher.*
- ***Essential Plant Pathology, Second Edition.*** 2010. Gail L. Schumann, Cleora J. D'Arcy. APS Press, 3340 Pilot Knob Road, St. Paul, MN 55121, <http://www.shopapspress.org> ISBN: 978-0-89054-381-9. 369 pp plus CD. Price: \$89.95. *Review needed.*
- ***Fungi from Different Environments.*** 2009. J.K. Misra, S.K. Deshmukh (eds.). Science Publishers, Enfield, New Hampshire, sales@scipub.net. Progress in Mycological Research vol. 1. ISBN: 978-1-57808-578-1. 393 pp. Price: \$109.00. *Requested from publisher.*
- ***The Lichens of Great Britain and Ireland.*** 2009. C.W. Smith, A. Aptroot, B.J. Coppins, A. Fletcher, O. Gilbert, P.W. James, P.A. Wolseley (eds.). British Lichen Society, London, UK. ISBN: 978-0-9540418-6-5. 1046 pp. Price: Unknown. *Requested from publisher.*
- ***Microbial Toxins: Current Research and Future Trends.*** 2009. Thomas Proft (ed.) Caister Academic Press, Caister, Norfolk, UK, www.caister.com. ISBN 978-1-904455-44-8. 192 pp. Price: \$310.00. *Review needed.*
- ***Molecular Plant-Microbe Interactions.*** 2009. K. Bouarab, N. Brisson (eds.), Oxford University Press, Oxfordshire, UK, www.oup.com. ISBN: 978-1-84593-574-0. 352 pp. Price: \$170.00. *Requested from publisher.*

Continued on following page

- **Naming Nature: The Clash Between Instinct and Science.** 2009. Carol Kaesuk Yoon. W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, NY 10110, <http://www.wwnorton.com>. ISBN 978-0-393-06197-0. 344 pp. Price: \$29.95. *Reviewed in this issue.*
- **Revision of the corticolous *Opegrapha* species from the Paleotropics.** 2009. Damien Ertz. Scheizerbart'sche Verlagsbuchhandlung, <http://www.schweizerbart.de> ISBN 978-3-443-

58081-0, Bibliotheca Lichenologica 102: 1–176. Price: €73. *Requested from publisher.*

- **Symbiotic Fungi.** 2009. Ajit Varma, Amit C. Karkwal. Springer, www.springer.com ISBN: 978-3540958932. Soil Biology 18: 1–430. Price: £128.25. *Requested from publisher.*

Previously Listed Books

- **Advances in Mycorrhizal Science and Technology.** 2009. D.P. Khasa, Y. Piché, & A. P. Coughlin (eds.). CABI Wallingford, Oxfordshire, UK, orders@cabi.org ISBN: 978-1-84593-586-3, ca. 200 pp. Price: €90.00, US \$89.98. *Requested from publisher.*
- **Applied Mycology.** 2009. M. Rai & P.D. Bridge (eds.). CABI Wallingford, Oxfordshire, UK, orders@cabi.org ISBN: 978-1-84593-534-4, 336 pp. Price: €135.00, US \$170.00. *Requested from publisher.*
- **Biodiversity and ecology of lichens.** 2009. André Aptroot, Mark R.D. Seaward, 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. *Reviewed in this issue.*
- **Biodiversity of the Powdery Mildew Fungi (Erysiphales, Ascomycota) of Israel.** 2009. Svitlana O. Voytyuk, Vasyl P. Heluta, Solomon P. Wasser, Eviatar Nevo, & Susumu Takamatsu. Paul A Volz (ed.). A.R.G. Ganter Verlag K.B.G. ISBN: 978-3-90616-674-2. 290 pp. Price: €89.00. *Requested from publisher.*
- **Black fungal extremes.** 2008. G.S. de Hoog, M. Grube (eds.). Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, www.cbs.knaw.nl/publications/index.htm. Studies in Mycology 61: 1-194. Price: €60.00. *Review needed.*
- **Common Interior Alaska Cryptogams: Fungi, Lichenicolous Fungi, Lichenized Fungi, Slime Molds, Mosses, and Liverworts, Second Edition.** 2009. Gary A. Laursen & Rodney D. Seppelt. University of Alaska Press, Fairbanks. 256 pp. plus figs. ISBN: 978-1-60223-058-3. Price: \$18.00. *Requested from publisher.*
- **Cortinarius in Sweden, Edition 11.** 2008. Karl Soop. <http://karl.soop.org/Eng-lish/mycopub.html> ISBN: 978-9197480-0-376, 156 pp. plus colored plates. Price: ca. \$129.00. *Requested from publisher.*
- **Collins Complete Guide to British Mushrooms and Toadstools.** 2009. Paul Sterry, Barry Hughes. Harper Collins. ISBN: 978-0-00723-224-6. Price: ca. \$28.00. *Review in progress.*
- **Macrofungi Associated with Oaks in Eastern North America.** 2009. Denise Binion, Steven Stephenson, William Roody, Harold H. Burdsall, Orson K. Miller, Larissa Vasilyeva. West Virginia University Press, Morgantown, <http://wvupressonline.com/node/91> . ISBN: 978-1-93320-236-5. 468 pp. Price: \$44.95. *Requested from publisher.*
- **Diversity, Ecology, and Conservation of Truffle Fungi in Forests of the Pacific Northwest.** 2009. James M. Trappe, Randy Molina, Daniel L. Luoma, Efrén 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, www.fs.fed.us/pnw/contact/index.shtml 194 pp. plus CD. Price: available upon request. *Requested from publisher.*
- **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. *Reviewed in this issue.*
- **Flora Fungorum Sinicorum vol. 31: Dematiaceous Dictyosporous Hyphomycetes excluding *Alternaria*.** 2009. Zhang Tianyu. www.hceis.com/book.asp?id=7673. ISBN: 978-7-03021-330-3. 231 pp. plus plates. Price: US\$36.00. *Requested from publisher.*
- **Flora Fungorum Sinicorum vol. 38: *Pestalotiopsis* Redactores Principales.** 2009. Ge Qixin, Chen Yuxin, & Xu Tong. www.hceis.com/book.asp?id=7673. ISBN: 978-7-03012-327-3. 235 pp. Price: US\$45.00. *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. *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, www.cbs.knaw.nl/publications/index.htm. ISBN: 978-90-70351-72-4. ISSN: 157-8859. Biodiversity Series 8. 196 pp. Price: €65.00. *Reviewed in this issue.*
- **The Genus *Crepidotus* in Europe.** 2008. Giovanni Consiglio, Ledo Setti. Associazione Micologica Bresadola, www.ambresadola.it/Editoria/newbook_ing.htm 344 pp. incl. 140 color microphotographs. Price: €60.00 plus mailing charges. *Requested from publisher.*
- **Malaysian Fungal Diversity.** 2007. E.B. Gareth Jones, Kevin D. Hyde, Vikineswary Sabaratnam (eds.). Mushroom Research Centre, University of Malaya, and Ministry of Natural Resources and Environment Malaysia, Kuala Lumpur, ketua_isb@um.edu, ISBN: 978-9-83208-593-5. 421 pp. Price: unknown. *Review needed.*
- **Methods for Working with Macrofungi. Laboratory Cultivation and Preparation of Larger Fungi for Light Microscopy.** 2009. Heinz Cléménçon. IHW-Verlag, Eching. ISBN: 978-3-93016-773-9. 82 pp. plus 33 figs. and 18 pl. Price: CHF38.00. *Requested from publisher.*
- **Microbiologically Safe Foods.** 2009. Norma Heredia, Irene Wesley, Santo Garcia (eds.). John Wiley & Sons, Inc., www.wiley.com. 667 pp. Price: \$135. *Reviewed in this issue.*
- **Microstructures of Vegetative Mycelium of Macromycetes in Pure Cultures.** 2009. Asya Buchalo, Oksana Mykchaylova, Margarita Lomborg & S.P. Wasser. Paul A Volz & Eviatar Nevo (eds.). 120 pp. plus 100 pl. Price: Unknown. *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, www.syracuseuniversitypress.syr.edu/fall-2009/milk-mushrooms.html. ISBN: 978-9-8156-3229-0. Price: \$110.00. *Review needed.*
- **A monograph of the genera *Conocybe* Fayod and *Pholiotina* Fayod in Europe.** 2009. Anton Hausknecht. Fungi Europaei Band 11, Edizioni Candusso. ISBN: 88-901057-8-X. In English and German. 986 pp. Price: Unknown. *Requested from publisher.*
- **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. *Reviewed in this issue.*
- ***Phaeocollybia* of Pacific Northwest North America.** 2009. Lorelei L. Norvell, Ronald L. Exeter. Bureau of Land Management, Salem, OR, 503-375-5646. 228 pp. plus over 500 colored photos. Price: \$71.00. *Review in progress.*
- **Pictorial Atlas of Soil and Seed Fungi, Morphologies of Cultured Fungi and Key to Species, Third Edition.** 2010. Tsuneo Watanabe. CRC Press, Boca Raton, FL 33487, www.crcpress.com ISBN: 978-0-84931-119-5. 184 pp. Price: \$189.98. *Requested from publisher.*
- **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, www.crcpress.com. ISBN 13:978-1-4200-4669-4. 558 pp. plus CD. Price: £42.99. *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, www.shopapspress.org. ISBN: 978-0-89054-367-2. 199 pp. Price: \$119.00. *Reviewed in Sep.-Oct. issue.*

TAKE A BREAK

Sweet Mystery this Sea

There is one knows not what sweet mystery about this sea, whose gently awful stirrings seem to speak of some hidden soul beneath.

— Herman Melville,
Moby Dick

A Marine Mycological Wordfind: Words run forwards, backwards, vertically, horizontally, diagonally, and letters may appear in more than one word. Asterisks indicate buried words, i.e. all their letters are used in other words. All letters are used. May be reprinted only with permission of the author and the Editor of Inoculum.

—Juliet Pendray
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d	o	g	u	e	t	b	a	i	r	e	a	h	p	s
b	u	d	a	i	l	i	a	r	t	l	t	t	o	t
l	a	r	o	t	t	i	l	r	a	i	l	a	r	a
s	u	l	a	i	g	i	a	s	g	c	a	e	e	i
a	n	i	t	r	a	p	s	m	r	h	s	h	h	n
m	y	c	o	p	h	y	c	o	b	i	o	s	i	s
d	i	o	v	o	b	o	u	a	a	n	c	o	p	e
e	a	g	l	a	d	a	s	n	l	a	i	o	r	a
g	a	l	l	i	n	i	i	a	a	t	r	w	i	n
a	i	a	c	i	p	s	p	t	n	e	r	t	r	i
b	n	o	t	e	t	n	i	a	i	w	h	o	e	a
i	l	i	t	a	a	r	c	o	d	i	u	m	p	t
a	l	a	l	e	t	a	a	l	o	i	s	a	r	p
s	l	k	c	a	e	g	r	e	p	a	n	d	a	e
m	a	o	f	k	s	a	d	o	m	i	a	a	c	s

Words:

codicola	repand	stalk	algae	silt*	bait	bud
littoral	salina	tetra*	ascus*	foam	MEAs	lab
Prasiola	sheath	Adomia	black	gall	Nia	Nia
Spartina	abyssal	balani	Moana	Nais*	Nia*	Nia*
Sphaera	balanid	balani*	Nohea*	peri	Nia*	sea
Barghoorn	caltrop	Codium	ocean	pore	seta	two
basipetal	cirrhous	Crouan	septa	pore*	salt	wet
mycophycobiosis	Lichina	Doguet	shell	seta	spore	agar
	obovoid	glltra	stain			
	Tralia	Padina				
	Algalus	Picard*				

Cookery Corner



Mushroom Lovers' French Bread Pizzas

Recipe by Rachael Ray taken from FoodNetwork.com

Prep Time: 15 min

Cook Time: 25 min

Serves: 4 (12-inch) French bread pizzas

Ingredients

8 large portobello mushroom caps

1 pound button mushrooms

1/2 pound shiitake mushrooms

3 tablespoons extra-virgin olive oil, 3 turns of the pan

2 tablespoons butter, cut into pieces

1 bay leaf

4 large cloves garlic, finely chopped

Salt and pepper

1/2 cup dry white wine, eyeball it

2 teaspoons Worcestershire sauce, eyeball it

1 tablespoon chopped fresh thyme leaves,

4 sprigs stripped and chopped

1 loaf crusty French bread, 24 inches

3 cups shredded Gruyere or Swiss cheese

Directions

Wipe mushrooms clean with a damp towel. Slice the mushrooms. Heat a deep skillet with extra-virgin olive oil and butter over medium heat. When butter melts into oil, add bay, garlic and mushrooms. Cook until mushrooms are dark and tender, 12 to 15 minutes. Season the mushrooms with salt and pepper and add wine. Deglaze the pan with

wine, eyeball the amount. Shake the pan and add the Worcestershire and thyme. Turn off heat.

Preheat broiler and split the loaf lengthwise and across. Hollow out a bit of the soft insides. Toast the bread lightly under broiler. Fill bread with mushrooms evenly then top with cheese liberally. Melt cheese until it browns and bubbles then remove the pizzas from the oven and turn off the broiler.

MYCOLOGICAL CLASSIFIEDS

Mold and Fungus Testing and Identification Services

Identification and contamination control for manufactured goods, food technology, buildings, animal and plant diseases. Specializing in identification of parasitic water-molds of Amphibians and Fish. ASTM & Mil-Spec 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.

Mushrooms in their Natural Habitats

FOR SALE a copy of the original "Mushrooms in their Natural Habitats" 2-volume 1949 set by Alexander Smith, including the 33 viewmaster reels. In very good condition (library tag on spine and some writing on inside cover). For pictures of a different copy of the book, see <http://www.cmnh.org/site/ResearchandCollections/Library/R>

[areBook/rb8.aspx](#). \$1200 to a good home. Rescued from the MSU Plant Research Lab reading room; proceeds will go to the Hans Kende Endowment (http://www.prl.msu.edu/Donate_to_PRL.html). Contact Jonathan Walton at walton@msu.edu or 517-353-4885.

MYCOLOGICAL JOBS

Plant Pathologist/Diagnostician at CAES

The Department of Plant Pathology and Ecology at The Connecticut Agricultural Experiment Station is seeking a full-time plant pathologist at the level of Assistant Scientist II. The primary responsibility of this position is the execution, coordination, and daily oversight of The Plant Disease Information Office, a full-service plant disease diagnostic laboratory serving all Connecticut stakeholders, private and commercial, utilizing molecular, serological, biochemical, and traditional diagnostic methods. Additional leadership responsibilities and duties include supervision of technical personnel, plant disease database management, cooperation with state and federal regulatory personnel, and participation in the National Plant Diagnostic Network (Northeast Division). The successful applicant will be expected to attend professional meetings, establish outreach programs by developing publications, articles, and web resources, collaborate with colleagues within the department and the Experiment Station, seek external funding sources, and publish research findings. Facilities in the Department and at the Experiment Station include fully equipped plant pathology and molecular biology laboratories, greenhouses, research farms, a BSL-3 laboratory, and close proximity to sequencing and oligo synthesis facilities at Yale University. The starting salary is \$68,145/yr with generous medical and dental benefits.

Applicants must have a Ph.D. in Plant Pathology or a professional degree such as a D.P.M. (Doctor of Plant Medicine). Preference will be given to candidates with expertise in

diagnostics or with bacterial or viral diseases and experience working with growers and grower-related problems. The ideal applicant will be a responsible, motivated individual with excellent organizational, interpersonal, and oral and written communication skills.

Interested candidates should submit a letter of interest with: 1) *Curriculum Vitae*, 2) statement of outreach and career goals, 3) reprints of recent publications, 4) university transcripts, and 5) arrange to have three letters of recommendation with contact information sent to: Dr. Sharon M. Douglas, Head, Department of Plant Pathology and Ecology, The Connecticut Agricultural Experiment Station, 123 Huntington Street, P. O. Box 1106, New Haven, CT 06504. Email: Sharon.Douglas@ct.gov. Website: www.ct.gov/caes. Review of applicants will begin immediately and will continue until a suitable applicant is found.

The Connecticut Agricultural Experiment Station is the nation's first state Agricultural Experiment Station, founded in 1875. The main campus is located in New Haven, with a 75-acre research farm in Hamden, a satellite research facility and farm in Windsor, and a research farm in Griswold. This is a state-supported scientific research institution dedicated to improving the food, health, environment, and well-being of Connecticut residents.

The Connecticut Agricultural Experiment Station is an Affirmative Action/Equal Opportunity Employer.

—Sharon M. Douglas
Sharon.Douglas@ct.gov

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.

I want to provide an **MSA Gift Membership** to the following individual:

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Please send renewal notices to:

(YOUR name) _____

(YOUR address) _____

Phone _____ FAX _____ Email _____

I agree to pay \$98* for this membership by check (payable to MSA, drawn on US bank) VISA Mastercard

Acct. # _____ Name (as it appears on card) _____ Exp. date _____

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.

December 6-10, 2009

X International Fungal Biology
Conference
Ensenada, Mexico
www.funguscongress.ucr.edu

August 1-6, 2010

9th International Mycological
Congress (IMC9)
Edinburgh, UK
<http://www.imc9.info/>

February 15-19, 2010

Gondwanic Connections
in Fungi Symposium
Bariloche, Argentina
www.sccongress2010.com.ar

2011 MSA Meeting

University of Alaska
Fairbanks, AK, USA

June 28-July 1, 2010

MSA Meeting
University of Kentucky
Lexington, KY, 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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info@mycotaxon.com

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mwach@sylvaninc.com

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inoculum

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AREAS OF INTEREST

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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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