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Feb. 15, 2013

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Collecting Trip to the Andes of Peru

During the period of late September to mid-October of 2012, the first phase of a three-year project (entitled "A biosystematic study of myxomycetes from the arid areas of Peru") was carried out. The overall purpose of the project, funded by a grant of \$215,000 awarded to the Real Jardín Botánico, CSIC, in Madrid by the Ministry of the Economy and Competitiveness of the government of Spain, is to obtain the first body of data on the myxomycetes (plasmodial slime molds) associated with plant communities in western and southern Peru.

The first collecting trip involved traveling approximately 2,700 miles on often winding roads throughout the portion of Peru that falls between 11°54' and 18°00' south latitude. Field surveys were carried out in 70 different collecting sites located over a range of elevations that extended from sea level to more than 16,000 feet (Fig. 1). These collecting sites were situated along a total of six east to west transects as well as a coastal north to south transect. All of the vegetation types encountered were xerophytic, and these included examples near the coast that receive moisture only from the coastal fog or "garua". Many of the plants making up these vegetation types are endemic, including species of cacti in such genera as *Neoraimondia*, *Browningia*, *Cleistocactus*, and *Haageocereus*.

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Fig. 1. High-elevation collecting site in the Andes of Peru.

These surveys yielded at least 675 collections of myxomycetes that had fruited under natural conditions in the field (Fig. 2) and more than 330 samples of substrate material that will be used to prepare moist chamber cultures for isolation of myxomycetes in the laboratory. The samples are currently being processed, but a surprising result obtained thus far is that moist chamber cultures prepared with dead portions of terrestrial bromeliads (*Tillandsia* spp.), collected partially buried in sand and growing under hyper-arid conditions, have been 100% positive for myxomycetes after only two months in culture.

Participants (Fig. 3) in this first collecting trip were **Carlos Lado** (Real Jardín Botánico), **Arturo Estrada-Torres** (Universidad Autonoma de Tlaxcala, Mexico), **Diana Wrigley de Basanta** (Real Jardín Botánico), **Gloria Vasquez** (Universidad Nacional Mayor de San Marcos in Lima, Perú), **Italo Treviño** (Grupo DIBIOS, Universidad Nacional San Agustín in Arequipa, Perú), **Adam Rollins** (Lincoln Memorial University in Tennessee) and **Steve Stephenson** (University of Arkansas). Logistical support was provided by Asunción Cano and Blanca León (Museo de Historia Natural, UNMSM, Lima).

—**Steve Stephenson**
University of Arkansas



Fig. 2. Looking for specimens of myxomycetes that have fruited under natural conditions in the field.



Fig. 3. Members of the group at 15,000 feet in the Andes (left to right): Adam Rollins, Carlos Lado, Gloria Vasquez, Diana Wrigley de Basanta, Arturo Estrada-Torres and Steve Stephenson.

Word for the day: “sphalma”

I ran across this word (meaning a slip in writing) in the article by Holm and Nannfeldt (Friesia 7: 42) where they explained that in the first edition of Fries’s *Scleromyces suecicae* Number 119 the material was labelled *Sphaeria incrustans* by mistake (“*incrustans* is sphalma for *obducens*”). Fries (Systema Mycologicum 2, p. 456) had corrected what he termed a “lapsus calami” to *Sphaeria obducens*.

—**Robert Shoemaker**
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MSA BUSINESS

President's Corner: Printed Journals and Big Business in Scientific Publishing

Thanks to those of you who voted in our election on by-laws change related to membership dues and print subscriptions. MSA members voted overwhelmingly in favour of reduced MSA membership dues including online only access to *Mycologia*, with print subscription as an option for an additional cost. If you renewed early, before December 31 and could take advantage of the early renewal discount, good on you. The early renewals help with budget and planning.

Personally, I still love high resolution figures printed on paper and so when I renewed for 2013, I bought a print subscription to *Mycologia* for the pleasure of browsing through beautiful pictures of fungi. As an undergraduate, I lugged armloads of bound journals home to write papers. About halfway through my undergraduate years, photocopying took over. I was glad not to be carrying books but sorry about the loss of resolution. I never forgave those early photocopyers for turning lovely, high resolution grey tone original figures into ugly black and white dots and lines on odd, thin thermal paper. If you missed the photocopy era, you are lucky. PDFs are so much better, and they finally offer back the lovely range of grey tones that had been lost through generations of improving but never perfect photocopyers. They even offer more colour and your choice of zoom. Much as I hate to admit it, PDFs are so great that it is time to ask whether we need print.

The economics of publishing is changing and the changes directly affect independent journals including *Mycologia*. Large scientific companies maintain profit margins by selling packages of journals to libraries. Libraries need to buy packages of various journals in order to subscribe to major journals that many researchers consider essential. This forces libraries to dedicate big chunks of their periodical budgets to buy packages of journals offered by Elsevier and Springer. Even if libraries would like to subscribe to an independent journal like ours, they have difficulty finding the dollars. This is tough for small, society-based journals and

may explain the slow decline of *Mycologia*'s institutional subscription numbers over the past several years. Because the institutional subscriptions pay for almost the entire cost of producing, printing and mailing *Mycologia*, reduced institutional subscription numbers mean that MSA must do things differently.

What do you think? One way to reduce *Mycologia*'s publishing expenses is to follow *New Phytologist* and the *American Journal of Botany* and move to online only journal production. *New Phytologist* is now online only and *AJB* will be soon. Dropping print saves production and mailing costs, or about 20-30% of the total cost of producing a journal. I was surprised that cost reduction was not greater, but it turns out that production, layout and design, and distribution remain expensive. The way to vote on this issue is with your annual membership. Choose an online only subscription if it meets your needs. If you value print add a print subscription to your MSA membership if you have not already done so.

Subscriptions and dues issues, and programming databases to handle all of the above are complicated. In the MSA election on dues, we inadvertently included a charge for print subscriptions into the MSA bylaws. We will formally ask MSA members' for support of a proposed amendment to the MSA Constitution in the spring election that will correct the error and remove print pricing from the bylaws. In conjunction with the new dues structure, Allen Press launched a new business website that had a few bugs initially. If you had any difficulty donating, renewing or subscribing to a print copy due to the new Allen Press website, please try again and let them, or me know about problems.

Thanks for your support of MSA over the past year and I look forward to your comments, suggestions and participation in guiding the society forward over the next year.

—Mary Berbee
MSA President
mary.berbee@gmail.com

Executive Vice President's Report



Lori Carris, Executive
Vice President

Greetings! As 2012 draws to an end, I want to wish all my colleagues and friends in the mycological community a peaceful and productive new year.

Council Business: There were two official email polls conducted by Council since my last column. One poll in October confirmed the Karling Annual Lecture Committee's nomination of Dr. Barbara Howlett (University of Melbourne) as the 2013 speaker. A second poll in December approved the recommendation of

a request for Emeritus status (see **Emeritus Members**, below). In other Council business, February 24 was selected as the date for the midyear Executive Council meeting, which will be held via teleconference.

2013 Membership Renewal: A big thanks to all of you who have already renewed your MSA membership. Your support and participation are critical to the future of our socie-

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ty. If you have not yet done so, renewing your membership is easy—just go the MSA website at <http://www.msafungi.org> and click on <Membership> in the upper left hand corner of the page. When you reach the MSA Business site, there is now an email reminder system for those of us who forget our MSA user ID or password.

New MSA Business Site: You may have noticed a new look for the MSA Business site. The new website was launched in December to coincide with the 2013 Membership Renewal Campaign. The site is designed to provide better access and security for our members. Unfortunately, some members encountered problems in accessing or navigating the site, for which we apologize. Your patience as we worked through these glitches with the helpful folks at Allen Press was greatly appreciated. I encourage you to contact me with suggestions or feedback on the new site.

MSA Donations: Some members experienced problems when attempting to include a donation with their membership renewal. If you were unable to make a donation, you can still do so through the MSA Business site. After login, select DONATIONS from the main menu options, and this will take you to a page with the various donations options. After selecting the fund you wish to support, you can specify the amount of your donation from a drop-down menu. As with all MSA transactions, Visa, MasterCard and Discover cards are accepted. We depend on these donations to fund many of the society's important activities including Mentor Travel Awards and Research Awards for graduate students, and thank you for your generous support.

New Members: I would like to extend a warm welcome to the following new and returning members. Their membership will be formally approved at the 2013 Annual Business Meeting in Austin, TX.

Argentina – Marta Noemi Cabello

Brazil – Meiriele Silva

France – Pierre Bonnet

Germany– Christian Wurzbacher

Hungary – Levente Kiss

United States – Nicolette C. Albright, Matthew E. Anderson, David Arora, Garrett Beier, Laura E. Bostic, Rayna G. Colletta, Andrii Gryganskyi, Christine N. Layton, Patrick Leacock, Rachael M. Martin, Jorge I. Mena-Ali, Daniel Raudabaugh, Wendy I. Taheri

Emeritus Members: Joost A. Stalpers, Centraalbureau voor Schimmelcultures, The Netherlands, a member of MSA for more than 40 years, has requested Emeritus status for 2013. Council has recommended by ballot to put this request before the membership for vote at the 2013 Annual Business Meeting.

Call for Nominations for Council: MSA is accepting nominations to fill Council positions for Vice President, Treasurer, and four Councilors. These nominations are important to the Society, and I encourage everyone to consider nominating a colleague. Nominations will be accepted through February 15, and can be submitted online (<http://www.surveymonkey.com/s/MSAcallfornominations>). You also can submit nominations to Vice President Jean Lodge by email (djlodge@caribe.net) or by regular mail (USDA-Forest Service PO Box 1377 Luquillo, PR 00773-1377). A list of past and present officers and councilors is available on the MSA website.

Important Announcement: As we prepare for the Spring 2013 elections, I want to remind everyone that balloting will be done electronically. As in the past, paper ballots will be sent out by regular mail to those without valid email addresses, so please check your information in the MSA directory to make sure it is correct. MSA By-Laws mandate that hard copy ballots be made available to members who do not have valid email addresses, and we remain committed to providing this service to members. However, this represents a substantial cost to the Society, and relatively few paper ballots are returned. Council will consider a proposed change in the By-laws for the 2013 spring ballot to have Society business, including voting, conducted electronically. If this change is approved, paper ballots will be sent out only upon request by contacting me by phone (509-335-3733), email (carris@wsu.edu) or mail (P.O. Box 646430, Washington State University, Pullman WA 99164-6430).

REMINDER: MSA Directory Update: Have you checked your information in the MSA directory recently? Now is a good time to make sure your address, phone and email are up-to-date. The Society relies almost entirely on email to bring you timely information on MSA news, awards, elections, meetings and other activities. To ensure that you receive Society blast emails and Inoculum, and so your colleagues can keep in touch, please check the accuracy of your contact information in the online directory. This can be accessed via our website (www.msa.org)—look for the “Member Services” box in the bottom left corner of the page. If you need assistance with updating your membership information, please contact our Association Manager at Allen Press, Kay Rose (krose@allenpress.com).

Please feel free to contact me about MSA business, or any other questions you have about the Society. And don't forget to recommend MSA to your amateur and professional colleagues, and particularly to students and postdoctoral associates who are interested in fungi. Remember, there is now a postdoctoral member rate!

—Lori Carris
carris@wsu.edu
MSA Executive Vice President

MYCOLOGICAL NEWS

Charles E. Bracker, 1938-2012

Professor Emeritus Dr. Charles E. Bracker, Purdue University, passed away November 4th, 2012, after a long illness. Charles earned his B.S. and Ph.D. in plant pathology at the University of California, Davis. He came to Purdue in 1964 as an assistant professor in the Department of Botany and Plant Pathology, progressed through the ranks, and was named the George B. Cummins Distinguished Professor of Plant Sciences in 1993. He was inducted into Purdue's Book of Great Teachers in 1999, and he received the Distinguished Mycologist Award from the Mycological Society of America in 1993.

Charles Bracker worked for more than 40 years in cell biological research and light and electron microscopy, discovering and documenting new mechanisms of mycelial growth and the 'chitosome,' a transport body for delivery of chitin synthase to the cell wall.

In mid-life, Charles was afflicted by a degenerative arthritic condition that, over time, made walking and standing precarious, but this never hampered his curiosity or ingenuity and his research, usually in collaboration with other workers, continued.

Post-retirement, Charles was probably best known for his extensive collection of orchids, which he expanded exponentially in honor of his wife, Anri, who passed away in 2001. His living collection and photographs (<http://libx.bsu.edu/cdm4/browse.php?CISOROOT=/Brck-Orchd>) have become well-known in the international orchid community and were donated to Ball State University where the living collection doubled the size of Ball State's already large holdings.

A memorial tribute-symposium at Purdue is envisioned for early 2013.

5th International Symposium on Rhizoctonia

The 5th International Symposium on Rhizoctonia will be held at Henan Agricultural University (HAU) in Zhengzhou, Henan, China, from 22 to 24 August 2013. We look forward to welcoming you to an exciting meeting that only occurs every 5 years and has been timed to take place immediately before the International Society of Plant Pathology Congress in Beijing.

As in past years, we will bring together a spectrum of scientists working on innovative and recent research related to disease ecology and management, genomics, host/parasite interactions and pathogenesis, pathogen detection and disease diagnosis, population biology and genetics, symbiosis, and taxonomy of *Rhizoctonia*. These topics will be presented in lectures and poster sessions, with adequate time reserved to share knowledge, exchange ideas, and foster collaborations. The symposium will provide an opportunity for academic, government, extension, and private industry researchers to interact with growers and students that share a common interest in *Rhizoctonia*. The

conference would also provide a forum to sit together and create a roadmap for future research of *Rhizoctonia* species complex

Contact Information

For scientific information: Suha Jabaji. Email: suha.jabaji@mcgill.ca

For registration, hotel reservation, payment: Honglian Lee. Email: honglianli@sina.com

Deadlines

Early bird registration	April 15, 2013
Hotel reservation	April 30, 2013
Abstract submission	May 1, 2013
Acceptance Notification	June 1, 2013

Conference Website

<http://www.icppbj2013.org/file/workshop/RhizoctoniaWorkshop.asp>

Cubeta Fulbright Report

Marc A. Cubeta, Professor at North Carolina State University, spent the past academic year as a Fulbright Scholar teaching and conducting research at the Swedish University of Agricultural Sciences (Sveriges LantbruksUniversitet, SLU) in Uppsala Sweden. Dr. Jan Stenlid, Professor and Head of the Department of Forest Mycology and Plant Pathology, served as host for Marc's sabbatical at SLU. Jan is an internationally recognized expert on the disease ecology of plant pathogenic soil fungi and genomics of the forest tree pathogen *Heterobasidion annosum sensu lato*. During his sabbatical, Marc co-taught *Diseases and Pest of Forest Trees*; and *Plant Pathology* to undergraduate and graduate students. He investigated the disease ecology and population dynamics of *Rhizoctonia* fungi on forest tree seedlings and closely related non-pathogenic species that associate with orchids. In addition he interacted with colleagues and presented seminars at SLU-Uppsala, SLU-Umea, CBS Fungal Biodiversity Centre-Utrecht, University of Copenhagen, and the INRA Ecogenomics of Interactions Laboratory. Cubeta was one of approximately 1,100 U.S. faculty and professionals who travel abroad each year through the Fulbright US Scholar Program.



Call for MSA Award Nominations 2012-2013

For over 20 years the Mycological Society of America has been celebrating excellence in research, teaching and service among its membership by recognizing outstanding students, distinguished teachers and accomplished researchers. This is a call for nominations and applications for MSA Awards and Fellowships for 2012-2013.

Be part of our celebration of mycology and mycologists!

Apply or nominate a student, researcher or teacher by February 15th 2013

To find detailed, updated information on the awards offered by the Society, eligibility requirements, application procedures and administering committees, please visit our web site (<http://msafungi.org/msa-awards>).

A full announcement will also be published in the upcoming issue of *Inoculum*.

The MSA looks forward to receiving your nominations and applications for the following awards:

MSA AWARDS

Distinguished Mycologist
Alexopoulos Prize
William H. Weston Award for Excellence in Teaching
MSA Fellows
MSA Honorary Members
MSA Graduate Fellowships
NAMA Memorial Fellowship
Backus Award
Salomon-Bartnicki-Garcia Award
Forest Fungal Ecology Research Award
Martin-Baker Award
John W. Rippon Research Award
Clark T. Rogerson Student Research Award
Alexander H. & Helen V. Smith Research Award
Mentor Student Travel Awards for Student travel to the Annual Meeting
Best Oral Presentation by a Student at the Annual Meeting
Best Poster Presentation by a Student at the Annual Meeting

MYCOLOGICAL CLASSIFIEDS

Mold and Fungus Testing and Identification Services

Biochallenge tests for ink, microfluidic materials; testing for resistance of materials to fungal invasion. Identification of fungal contaminants in manufactured products. Epifluorescent microbial detection in deionized water systems, microfluidic devices, medical fluids, manufactured goods.

Identification of fungi from buildings, animal and plant diseases. 10% discount for regular and sustaining MSA members. Email info@pacificanalytical.com. For more information see www.pacificanalytical.com

Biological Control, Biotechnology and Regulatory Services

Center for Regulatory Research, LLC specializes in regulatory permit application services for biological control and biotechnology organisms/products. Let us evaluate your research discoveries for commercial potential and environmental impacts. We also offer assistance with writing proposals for SBIR grant programs (Small Business

Innovation Research) that fund new commercial ventures. Contact Dr. Sue Cohen by email (sdcohen@regresearch.com) or by phone (612-246-3838). For more information about our company, visit our website at www.regresearch.com.

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.

MYCOLOGIST'S BOOKSHELF

We have four reviews for this issue, and I've added some new titles to the list below, which has been updated indicating which books are already in the process of being reviewed, and which still need reviewers. Just as a reminder, I've adopted a new process for getting books to you, whereby books will be "drop-shipped" directly from publisher to reviewer; this will streamline the process at my end and will save the Society the shipping expense. Also of note, and perhaps a trend: one of the publishers whose books we frequently review is adopting a new policy that currently only applies to some of their books: the review will have to be done using an online version (though not a pdf or something for a Kindle or e-reader); once they receive a copy of the published review, they'll ship the reviewer the hard copy. This will be the case with the Springer "Laboratory Protocols in Fungal Biology" by Gupta et al.

If you would like to review a book or CD, please contact me (robert.marra@ct.gov). A book goes to the first person requesting it, and I ask that you get your reviews to me in a reasonably timely manner. Also, if you know of a newly published book that might be of interest to mycologists, please let me know so I can request it from the publisher.

—Bob Marra

Books in Need of Reviewers

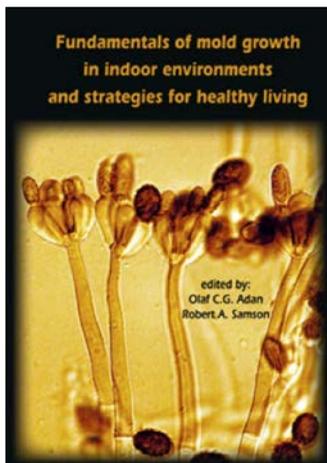
- ****Funga Nordica, 2nd ed. 2012.** H. Knudsen and J. Vesterholt (Eds.). Nordsvamp, Copenhagen. ISBN: 9788798396130. 1083 pp (2 volumes). Price £95, €111.15.
- **** Atlas of Soil Ascomycetes.** 2012. J. Guarro, J. Gene, A.M. Stchigel and M.J. Figueras. CBS Biodiversity Series 10. ISBN: 978-90-70351-88-5. 486 pp, 322 figures. Price: € 70 (hardcover).
- ****The genus *Cladosporium*.** 2012. K. Bensch, U. Braun, J.Z. Groenewald, and P.W. Crous. CBS Studies in Mycology No. 72. ISBN: 978-90-70351-91-5. 401 pp, full illustrated with color pictures (A4 format). Price: € 70 (softcover).
- **** *Colletotrichum*: Complex species or species complexes?** 2012. U. Damm, P.F. Cannon, P.W. Crous (Eds.). CBS Studies in Mycology No. 73. ISBN: 978-90-70351-92-2. 213 pp, fully illustrated with color pictures (A4 format). Price: € 65 (softcover).
- ****Microbial Carotenoids from Fungi: Methods and Protocols.** 2012. Jose-Luis Barredo (Ed.). Humana Press (Springer). ISBN: 978-1-61779-917-4. 290 pp, 51 illus., 9 in color. Price: \$119 (hardcover); \$94.99 (e-book).
- ****Neurospora: Genomics and Molecular Biology.** January 2013. D. P. Kasbekar and K McCluskey (Eds.). Horizon Press. ISBN: 978-1-908230-12-6. 294 pp, w/illus. Price: \$319 (hardback).
- **Fungi of Serbia and Western Balkans [Gljive Srbije I Zapadnog Balkana].** 2009. Branislav Uzelac (photographs by Goran Milosevic). BGV Logik, Belgrade, Serbia. Branislav Uzelac. 2009. BGV Logik, Serbia (english@glijvari.org.rs) or (goran.milosevic@poducavanje.co.rs). ISBN 978-86-912677-0-4. 464 pp. 464, ca. 1200 color photographs. Price 120 €.
- **Plant Fungal Pathogens: Methods and Protocols.** 2012. Melvin D Bolton, Bart PHJ Thomma (Eds). Part of the "Methods in Molecular Biology" series, v.835. Springer-Verlag, Berlin. www.springer.com. ISBN: 978-1-61779-5008. 769 pp, 138 illus., 74 in color. Price: \$159.00 (hardcover).
- **Elements of Evolutionary Genetics.** 2010. Brian Charlesworth and Deborah Charlesworth. Roberts & Company Publishers, Greenwood Village, CO. www.roberts-publishers.com/. ISBN: 978-0-9815-1942-5. 768 pp, b&w. Price: \$80 (softcover).
- **The Analysis of Biological Data.** 2009. Michael Whitlock and Dolph Schluter. Roberts & Company Publishers, Greenwood Village, CO. www.roberts-publishers.com/. ISBN: 978-0-9815-1940-1. 704 pp, full color. Price: \$80 (hardback).
- **Laboratory Protocols in Fungal Biology: Current Methods in Fungal Biology.** Avail June 2012. Vijai Kumar Gupta, Maria Tuohy, Eds. Springer-Verlag, Berlin. www.springer.com. ISBN: 978-1-4614-2355-3. 802 pp, 105 illus., 40 in color. Price: \$279.00 (hardcover). *Review Copy online only; hardcover copy provided following receipt of published review.*
- **Key For Identification of Common *Phytophthora* Species.** 2011. Jean Beagle Ristaino. APS Press, St. Paul, MN. www.apsnet.org. ISBN: 978-0-89054-397-9. CD-ROM. Price: \$269.00 (single user).

** New this issue.

Fundamentals of Mold Growth in Indoor Environments

Fundamentals of Mold Growth in Indoor Environments and Strategies for Healthy Living, 2011.

Olaf C.G. Adan & Robert A. Samson (Eds). Wageningen Academic Press. www.wageningenacademic.com. 978-90-8686-135-4. 524 pp. (hardback). Price: €97.



Indoor fungi have attracted a great deal of attention from the public, media, and scientists due to human health risks and a resulting flood of litigations (including some high profile cases) filed in the United States since 1994. As a result, research on indoor fungi, from aspects of mycology, industry hygiene, public health, and medicine. It also led insurance companies to change or even exclude indoor molds from their policies. In the meantime, *Stachybotrys chartarum* (Ehrenb.) S. Hughes has gained notorious fame. A number of books on indoor molds were published during this period. "Fundamentals of Mold Growth in Indoor Environments and Strategies for Healthy Living" is the latest one with a comprehensive and updated coverage on this topic.

This book is composed of 18 chapters: Preface. 1. Introduction. 2. Water relations of fungi in indoor environments. 3. Fungal growth and humidity fluctuations. 4. The fungal cell. 5. Ecology and general characteristics of indoor fungi. 6. Characteristics and identification of indoor wood-decaying basidiomycetes. 7. Health effects from mold and dampness in housing in western societies: early epidemiology studies and barriers to further progress. 8. Aerosolized fungal fragments. 9. Mycotoxins on building materials. 10. WHO guidelines for indoor air quality: dampness and mold. 11. Moisture content measurement. 12. The fungal resistance of interior finishing materials. 13. Detection of indoor fungi bioaerosols. 14. Mold remediation in North American buildings. 15. Mold remediation in West-European buildings. 16. Protection of wood. 17. Coating and surface treatment of wood. 18. Recommendations.

The book was well written and organized. It clearly differentiates itself from other books on this topic in several areas. As the authors pointed out, confusion has often been caused by the misapplication of fungal names and misidentification of indoor fungi. The authors advocate that professionals working on indoor molds follow the Nomenclature (currently, International Code of Nomenclature for algae, fungi, and plants) to use correct fungal names, not outdated or old names based on the latest development of polyphasic taxonomic research on several genera, such as *Aspergillus*, *Penicillium*, and *Verticillium*. The application of correct names is a reflection of not only the current status of fungal taxonomy, but also species concept and delineation. More importantly, health effects of

indoor fungi are species specific. The authors clearly and unquestionably showed that it only took 69 h for *Penicillium chrysogenum* Thom to develop from spore germination to sporulation and 73 h to develop mycelial mass on pure gypsum at 21°C and 97% RH with cryo-SEM photos (see page 45). How much time do we have to respond to water damage or dampness problem to prevent molds? Wood decaying basidiomycetes are either barely or not covered in other indoor mold books. This book devoted three chapters to covering the characteristics and identification of wood decaying fungi and the protection of wood with in-depth information and good quality of color photos. Common wood decaying fungi were covered to species level whenever is possible. There is an excellent coverage on aerosolized fungal fragments in this book. The authors introduced the new terms: "gonomorphic" and "non-gonomorphic" for reproductively differentiated and non-differentiated forms, respectively.

The risk posed by airborne fungal fragments to human health, especially non-gonomorphic form, has often been underestimated in indoor mold studies. Readers who are interested in this area will not be disappointed with the information on the process of fungal fragmentation, contributions of hyphal fragments and particulates to the environment, and their implications for human health. "Mycotoxins on building materials" were well reviewed. The authors brought six hurdles to the attentions of researchers who are studying mycotoxins in buildings (pages 246-247). These hurdles revealed how difficult it can be to study mycotoxins indoors. The authors reinforced their opinion with detailed discussion on a number of studies with false positive results or invalid conclusions due to deficiency in analytical methods. The authors indicated that exposure to fungi derived not only from spores and large hyphal fragments, but also from fragments much smaller than the spores (0.3µm) and toxins detected in fine particle matter and fine dust. The information in this chapter and the chapter "Aerosolized fungal fragments" suggested that current strategies for air sampling for fungi need to be further studied. The people who are interested in mycotoxins in buildings should read this chapter thoroughly. The authors of "Detection of indoor fungi bioaerosols" had good discussions on the recovery losses associated with jet-to-plate distance and biological recovery efficiency. How many people thought that the recovery loss of air sampling may derive from how much medium we pour into plates? If that did not ring a bell, please read this chapter. Two chapters (14 and 15) on mold remediation in North America and West Europe revealed the differences in guidelines and approaches in the two continents. However, the principles are similar.

I really enjoyed reading this book. While reading, I spotted several places where improvements can be made. For example, Figures 2.9 and 3.4 are produced from the same set of data and Figure 3.4 is redundant. Table 10.1 is irrelevant to indoor mold and can be removed. Table 1 on page 398 should be Table 14.1.

Continued on following page

These minor issues will not negate the fact that this book is an excellent reference book for all professionals who work on indoor fungi. It is also a very informative reference book for mycologists who are not working on indoor fungi. In my personal opinion, the information you obtain from this book

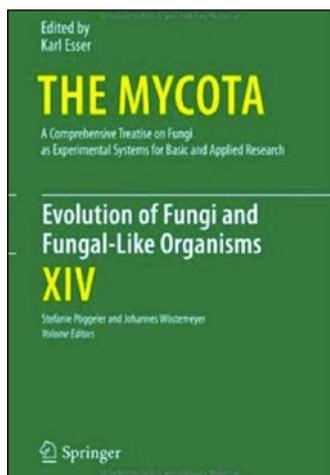
(not covered in the other books) well surpasses the moderate price you pay for the book. You will not regret it.

—De-Wei Li

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The Mycota, Vol. 14: Evolution of Fungi and Fungal-Like Organisms

The Mycota, Vol. 14: Evolution of Fungi and Fungal-Like Organisms. 2011. Stefanie Pöggeler, Johannes Wöstemeyer (Eds.). Karl Esser (Series Ed.). Springer-Verlag, Berlin.
www.springer.com. ISBN: 978-3-642-19973-8. 345 pp, 60 illus., 10 in color. Price: \$269.00 (hardcover).



As were the previous volumes of Springer's giant series "The Mycota," volume XIV ("Evolution of Fungi and Fungal Like organisms") is not a book in the traditional sense. Rather, as the preface emphasizes, it is a gathering of reviews dealing with various aspects of fungal evolution. The reviews are diverse and heterogeneous in regard to not only their topics but also their concepts, details, actualities and even text formatting.

The first section, "Evolutionary Roots of Fungi," contains three reviews. "The Protistan Origins of Animals and Fungi" massively overviews the main groups of the Ophistoconta and the position of Kingdom Fungi. It includes results published in 2011, quite refreshing for a book printed in the same year. However, the authors began writing the chapter much earlier, judging from the text, when Deep Hypha was running. The next chapter reviews the main features of the Microsporidia and the problems of its phylogenetic position. The last section covers DNA-based methods in studies of fungal diversity. The traditional clone-library technique and its limitations are discussed. Clone-library-based fungal diversity studies of aquatic environments are presented, and results from soil and *in-planta* environments are briefly mentioned. The 454 technique of the "next-generation" sequencing methods and fluorescent *in-situ* hybridization (FISH) are discussed as alternative methods for environmental study of fungal communities.

Three reviews appear in the second section, "Evolution of Signaling in Fungi and Fungal-Like Organisms." The first review concerns the "fungal-like" dictyostellids. Only an outmoded tradition retains these social amoebae in mycological books, but the chapter is really worth reading. It comprehensively overviews evolutionary aspects of signaling, and the regulation of morphogenesis in the group, in particular the unusual method of cellular organization whereby multicellulari-

ty originates by cell aggregation rather than cell division. The second review gives a detailed overview of pheromones and pheromone receptors of ascomycetes. Although the title focuses on filamentous fungi, it briefly discusses baker's yeast as well. The review deals with structure and function of pheromones, their receptors and, because of their functions, mating types and thallisms. However it is not the review one should read if particularly interested in the evolution or evolutionary function of those systems. The third review of the section concerns mating types and uni-, bi- and tetrapolar patterns of sexuality of basidiomycetes. This is a heavyweight review: its 64 pages, including more than 400 references, are really challenging to read in one sitting. After a general overview of mating type genes it discusses the three subphyla of the Basidiomycota (Pucciniomycotina, Ustilaginomycotina including the *incertae sedis* Malasseziales, and Agaricomycotina) in separate chapters, closing each chapter with evolutionary considerations.

The next section, "Evolution of Mutualistic Systems and Metabolism in Fungi," contains five reviews. The first, on Glomeromycota, discusses historical aspects of its taxonomy and systematics. Phylogenetic evolution, especially the possible coevolution with plants and evolutionary aspects of asexuality are also discussed. The second review is about ascomatal evolution in the Ascomycota. It is the only chapter in the book emphasizing that phylogenies might be frameworks for tracing evolution of different characters; *i.e.* there is much more to evolutionary studies "beyond building the tree." The importance and use of ascomatal characters in the "pre-molecular" era and then the early molecular studies of the main groups (classes) of Pezizomycotina are overviewed. After a discussion of patterns of morphological evolution, in the part "Beyond Building the Tree: Statistical Tests of Character Evolution" the readers are given a short introduction to comparative methods illustrated by a case study of fruiting body evolution in Lecanoromycetes. The next review concerns comparative genomics illustrated with genomic analyses from Dothideomycetes. It then gives a short introduction to comparative genomics, especially synteny, and discusses different genetic mechanisms of genome evolution that may affect *e.g.* pathogenicity. The review is up to date: data from 2010 and 2011 are cited and discussed. The fourth review focuses on secondary metabolites of fungi, describes polyketids, nonribosomal peptides, alkaloids, terpenes and melanins. The reader can gain an overview of those metabolites, their genes and synthesis: polyketides and polyketide syntheses and melanins are the most detailed. The fifth review in this section covers carbonic

Continued on following page

anhydrases and, besides those of the true fungi, overviews enzymes of *Phytophthora* and *Dictyostelium*. Most of this review deals with alfa- and beta-anhydrases of filamentous ascomycetes.

The third section of the book is entitled “Evolutionary Mechanisms and Trends,” and its two chapters fit well in line with the previous section. The first is about evolution of mating-type loci and chromosomes of filamentous ascomycetes. Some parts overlap with topics discussed in previous chapters, especially when, contrary to the title, it discusses nonascomycetous fungi such as *Cryptococcus neoformans* and *Microbotrium violaceum*. Nevertheless, both the comparative aspects and the potential evolutionary mechanisms that pervade the entire chapter give a refreshing angle to the review. The last chapter of the book concerns the special metabolism of fungi: concepts, mechanisms and pathways. In addition to general considerations, it discusses certain metabolites and their biosynthesis pathways.

Conceptualizing of a multi-chaptered, multi-authored book is challenging, especially when the topic is as broad and diverse as the evolution of fungi. Sometimes years pass between the planning and the printing of such a book because of

procrastinating authors, quixotic publishers, etc. Some reviews in The Mycota XIV were evidently written a few years ago; some of them were updated by adding results of recent literature; others were not updated. The reviews of the book are diverse but over-represent the signaling, mating, and metabolite-related topics; several factors (e.g. finding authors willing to contribute) may affect such an unbalanced selection. Some chapters lack a discussion of evolutionary aspects; some others deal with it by “simply” listing features according to different taxonomic/phylogenetic groups. Nevertheless, most of the reviews are comprehensive, detailed presentations of the topics that can be useful in teaching or as an overview of that field.

Even though missing concepts and the sometimes neglected evolutionary aspects may annoy you, ignore the chapter titles and you will have a massive, albeit rather expensive, selection of strong reviews. And a practical advice: don't read it as a book; do not even try...unless you agreed to review it!

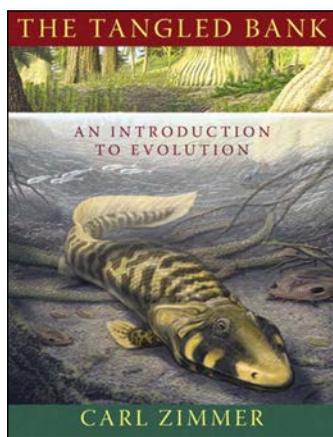
—Gábor M. Kovács

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The Tangled Bank: An Introduction to Evolution

The Tangled Bank: An Introduction to Evolution. 2010. Carl Zimmer. Roberts & Company Publishers, Greenwood Village, CO. www.roberts-publishers.com/. ISBN: 978-0-9815-1947-0. 394 pp, full color. Price: \$48 (hardback).

With the news of the last few weeks that much of ‘junk’ DNA is, in fact, functionally important, this text is already out of date. As with evolution, the textbook writer faces the Red Queen’s Dilemma. However, it is an excellent survey and a well-produced volume on evolution for the non-biologist. Well written, clearly presented and concise, it could well serve as either a primary or secondary text for university level courses for non-majors. Zimmer, a science writer and author of several books (I highly recommend his *Parasite Rex*) and many articles, clearly explicates most of the central issues in evolutionary biology. It’s difficult from the perspective of a research scientist to evaluate the rigor of his exposition for non-biologists, but he seems to approach the Goldilocks optimum of neither too much nor too little. Most important, he emphasizes hypothesis testing and clearly shows how much of modern evolutionary biology is testable and has been tested. This is important in the face of the public’s lack of understanding and confusion about the subject, promoted by the creationist and intelligent design projects. As I’m sure every member of the



MSA agrees, evolution is both the unifying principle of modern biology and its elucidation one of the central concepts of civilized thought.

How are key concepts tested? Zimmer provides case studies from laboratory to field that demonstrate the power of natural selection, the importance of genetic drift and the effects of neutrality on the observed diversity of life. He is correct and emphatic on the interdependence of organisms and their environments. How do palaeontologists test evolution? Zimmer shows how predictions are both made and supported by findings from the fossil record.

While his primary examples are animals and of these, his emphases are on vertebrates, he also shows that life on earth is dominated by Eubacteria and Archaea; because so many of the more sophisticated laboratory demonstrations of key concepts rely on the short generation time of microbes, there is a reasonable balance among the Domains. Influenced by his strong background in parasitology, he observes the importance of parasites and pathogens as drivers of evolutionary processes. He includes a chapter on evolution and medicine. He under-emphasizes mathematics and modelling probably because the book is designed for a humanities audience. Still, he does give them mention (e.g. Hardy-Weinberg equilibria) and notes their importance in conceptual development. The absence of information about fungi—particularly the complexities of mating type, the implications of heterokaryosis and the dikaryon and their evolutionary implications—is one of the few glaring weaknesses of what is otherwise a volume so well-written and nicely presented (excellent illustrations abound) and relatively up-to-date (always difficult in a rapidly advancing field) that it could be leisure reading for practicing scientists only tangen-

Continued on following page

tially studying evolutionary questions.

While it has been some time since this reader has viewed course catalogues, my recollection is that there were few courses offered for non-majors explicitly focussed on evolution. Should you be aware of one at your institution, this volume would serve as a highly recommended primary text. It

would also serve the needs of secondary school teachers as a resource for presentation of modern biological thought.

—David Yohalem
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Parasites in Ecological Communities

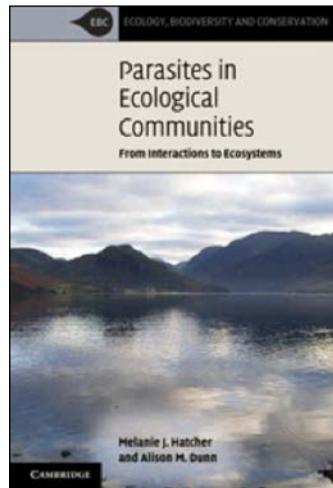
Parasites in Ecological Communities: from Interactions to Ecosystems.

2011. Melanie J. Hatcher and Alison M. Dunn. Part of the *Ecology, Biodiversity and Conservation* series. Cambridge University Press, Cambridge, UK. www.cambridge.org.

ISBN: 9780521718226. 464 pp, 113 b/w illus., 7 tables. Price: \$60.00 (paperback).

Where in a food web do parasites lie? How much do they affect community structure, biodiversity and ecosystem health? These are questions that were largely ignored in the development of community ecology; however, despite observations of their importance to interspecific interactions dating back to the 1940s, research into their importance did not really develop until the early 1990s when Robert May and others published seminal models for the requirements for parasites to establish and be maintained in populations. Since then, both theoretical and empirical research on the effects of parasites on host populations and communities have accelerated. These researches have revealed different outcomes in terms of epidemic development dependent on mode of transmission (*i.e.* vertical or horizontal, density or frequency dependence) as well as other factors including differential parasite virulence expressed among hosts. The first four chapters of the present volume present various mathematical models for detailing epidemiological and community ecological approaches for one host-one parasite systems, ‘apparent competition’, parasite-mediated competition (both for specialist and generalist parasites), effects of parasites on predation, and parasites and intraguild predation. An awareness of two parameters, the basic reproductive number for the parasite, called R_0 , and the threshold population size of the host for parasite establishment, N_T , is implicit in all models. Generally, the authors present their models using a trophic module approach. While there is little information presented on fungal parasites (chytridiomycoses in amphibians, cryptosporidial infections of many arthropods) in these chapters, they are thought-provoking.

In Chapter 5, the authors (both are actively involved in research on amphipods) examine the effects of plant pathogens



and parasitic plants. They observe that the assumptions of ‘standard’ epidemiological models are abrogated when discussing plants and their pathogens, due to a variety of causes including the fixed position of plants (which affects assumptions of randomness built into N_T) and the tissue specificity of many plant pathogens. However, plant pathogens are implicated in several cases of observed trophic cascades, chestnut blight being a prime example. This chapter includes brief comments on fungal endophytes (and mycorrhiza) and their effects on communities. However, these discussions, while thought-provoking, are phytopathologically naive. Several cases come to mind that the authors neglect: South American leaf blight of rubber, which explicitly maintains the low density of rubber trees in their native habitat and for which strategies for prevention of establishment in southeast Asian plantations were developed in the 1950s; the emergent moderately wide-host range *Phytophthora ramorum* and *P. kernoviae*; and the major consequences of *P. cinnamomi* on Australian landscape. Understanding the biology of the several components of a pathosystem is essential; indeed, it underlies the formulation of descriptive and predictive models. As the authors repeatedly demonstrate, generalization is always elusive.

The next three chapters of the book examine parasites in invasions, ecosystem parasitology and emerging diseases in humans in wildlife. These aspects are supported by several case studies, but have generally defied theoretical modelling, due in part to the plethora of variables rendering them mathematically intractable. Still, general principles can be derived and parameters of importance can be identified. A final brief chapter (“Where do we go from here?”) suggests areas of future research that should be addressed in order to better understand and predict the importance of parasites in ecological communities.

The paucity of information related to fungi may limit the readership among mycologists to those involved or interested in broader community issues. Of these, only those with an affinity for ecological modelling will find the book edifying. Not that the information is not interesting or well-presented—it is—but the text is designed for graduate students and specialist researchers and is heavily biased towards animal-parasite systems; not for lay readers nor for those without the requisite background.

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Books with Reviewers Assigned

- **Fundamentals of Mold Growth in Indoor Environments and Strategies for Healthy Living.** 2011. Olaf CG Adan & Robert A Samson (Eds). Wageningen Academic Press, Wageningen. www.wageningenacademic.com. ISBN: 978-90-8686-135-4. 524 pp. (hardback). Price: € 97. *Reviewed this issue.*
- **The Tangled Bank: An Introduction to Evolution.** 2010. Carl Zimmer. Roberts & Company Publishers, Greenwood Village, CO. www.roberts-publishers.com/. ISBN: 978-0-9815-1947-0. 394 pp, full color. Price: \$48 (hardback). *Reviewed this issue.*
- **Parasites in Ecological Communities: from Interactions to Ecosystems.** 2011. Melanie J. Hatcher and Alison M. Dunn. Part of the *Ecology, Biodiversity and Conservation* series. Cambridge University Press, Cambridge, UK. www.cambridge.org. ISBN: 9780521718226. 464 pp, 113 b/w illus., 7 tables. Price: \$60.00 (paperback). *Reviewed this issue.*
- **The Mycota, Vol. 14: Evolution of Fungi and Fungal-Like Organisms.** 2011. Stefanie Pöggeler, Johannes Wöstemeyer (Eds.). Karl Esser (Series Ed.). Springer-Verlag, Berlin. www.springer.com. ISBN: 978-3-642-19973-8. 345 pp, 60 illus., 10 in color. Price: \$269.00 (hardcover). *Reviewed this issue.*
- **Elements of Evolutionary Genetics.** 2010. Brian Charlesworth and Deborah Charlesworth. Roberts & Company Publishers. www.roberts-publishers.com. ISBN: 9780981519425. 768 pp, b&w. Price: \$80 (hardcover).
- **The Mycota, Vol. 10: Industrial Applications, 2nd ed.** 2011. Martin Hofrichter (Ed.). Karl Esser (Series Ed.). Springer-Verlag, Berlin. www.springer.com. ISBN: 978-3-642-11457-1. 485 pp, 152 illus. Price: \$269.00 (hardcover).
- **Taxonomic Manual of the Erysiphales (Powdery Mildews).** 2012. Uwe Braun and R.T.A. Cook. CBS Biodiversity Series 11. ISBN: 978-90-70351-89-2. 707 pp, 853 figures. Price: € 80 (hardcover).
- **Biomonitoring, Ecology, and Systematics of Lichens.** Bibliotheca Lichenologica vol 106. 2011. Scott T Bates, Frank Bungartz, Robert Lucking, Maria A Herrera-Campos, Angel Zambrano (Eds.). Borntraeger/Schweizerbart Science Publishers, Stuttgart. www.schweizerbart.de. ISBN: 978-3-443-58085-8 442 pp, 102 figures, 33 tables, 16 color plates. Price: €109.00 (softcover).
- **Evolution: Making Sense of Life.** Available August 2012 (copyright year 2013). Carl Zimmer and Douglas J. Emlen. Roberts & Company Publishers, Greenwood Village, CO. www.roberts-publishers.com/. ISBN: 978-1-9362-2117-2. 800 pp, printed in four colors. Price: \$92 (hardback).
- **Biodiversity in Dead Wood.** 2012 Juha Siitonen, Bengt Gunnar Jonsson. Cambridge University Press, Cambridge, UK. www.cambridge.org. ISBN: 9780521717038. 524 pp, 92 b/w illus. 21 tables. Price: £38.00 (paperback).
- **Pollination Biology.** 2012. D. P. Abrol. Biodiversity, Conservation, and Agricultural Production. Springer-Verlag, Berlin. www.springer.com. ISBN: 978-94-007-1941-5. 792pp, 23 illus., 18 in color. Price: \$209.00 (hardcover).
- **Fungal Plant Pathogens (Principles and Protocols Series).** March 2012. CR Lane, P Beales, KJK Hughes (Eds). CABI, Oxfordshire, UK. www.cabi.org. 978-1-8459-3668-6. 324 pp. Price: \$75.
- **Practical Guide to Turfgrass Fungicides.** 2011. Richard Latin. APS Press, St. Paul, MN. www.apsnet.org. ISBN: 978-0-89054-392-4. 280 pp, 115 images, 29 chemical structures. Price: \$139.95 (hardcover).
- **Biology of Lichens – Symbiosis, Ecology, Environmental Monitoring, Systematics and Cyber Applications.** Bibliotheca Lichenologica vol 105. 2010. Thomas Nash III, Linda Geiser, Bruce McCune, Dagmar Triebel, Alexandru M Tomescu, William Sanders (Eds.). Borntraeger/Schweizerbart Publishers, Stuttgart. www.schweizerbart.de. ISBN: 978-3-443-58084-1 256 pp, 81 figures, 19 tables. Price: €79.00 (softcover).
- **Coalescent Theory: An Introduction.** 2009. John Wakeley. Roberts & Company Publishers, Greenwood Village, CO. www.roberts-publishers.com/. ISBN: 978-0-9747-0775-4. 352 pp, b&w. Price: \$48 (softcover).
- **Biology of Marine Fungi.** 2012. Chandralata Raghukumar (Ed). Part of the “Progress in Molecular and Subcellular Biology” series, v.53. Springer-Verlag, Berlin. www.springer.com. ISBN: 978-3-642-23341-8. 354 pp, 83 illus., 27 in color. Price: \$209.00 (hardcover).
- **Tree Thinking: An Introduction to Phylogenetic Biology.** Available July 2012. David Baum and Stacey Smith. Roberts & Company Publishers, Greenwood Village, CO. www.roberts-publishers.com/. ISBN: 978-1-9362-2116-5. 400 pp, b&w. Price: \$60 (hardback).
- **Forest Health: An Integrated Perspective.** 2011. John D. Castello, Stephen A. Teale (eds.). Cambridge University Press, Cambridge, UK. www.cambridge.org. ISBN: 9780521766692. 404 pp, 80 b/w illus. 7 tables. Price: £65.00 (hardcover).
- **Yeast Research: An Historical Overview.** 2011. James A. Barnett, Linda Barnett. ASM Press, Washington, DC. www.asmpress.org. ISBN: 978-1-55581-516-5. 392 pp, illus. Price: \$159.95 (hardcover).
- **Medically Important Fungi: A Guide to Identification, 5th ed.** 2011. Davise H. Larone. ASM Press, Washington, DC. www.asmpress.org. ISBN: 978-1-55581-660-5. 508 pp, illus, color plates. Price \$109.95 (hardcover).
- **Microbial Biofilms: Current Research and Applications.** 2012. Gavin Lear, Gillian D. Lewis (Eds.). Caister Academic Press, Norfolk, UK. www.caister.com. 228 pp. Price: GB £159, US \$310 (hardcover).

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 dnatvig@gmail.com. **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/

ASCOFrance.com, a very useful site for illustrations of ascomycetes including anamorphs (accessible in both French and English)
ascofrance.com/?lang=us

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

Basidiomycete Research Group (University of Helsinki, Finland) studies systematics, ecology and evolution of fungi in forest environment.
www.basidio.fi

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)
<http://blog.mycology.cornell.edu/>

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

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

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

German Mycological Society DGfM
www.dgfm-ev.de

Glomeromycota PHYLOGENY
amf-phylogeny.com

MYCO-LICH facilitates mycology and lichenology studies in Iran.
www.mycyco-lich.com

Mycologia
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 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.
www.eaglehill.us

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)
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 is an internationally recognized not-for-profit 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.mycokey.com

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

New Electronic Journal about mushrooms from Southeast Mexico (61-4)
<http://fungavera.blogspot.com>

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 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/

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

Trichomycete site includes monograph, interactive keys, a complete database, world literature, etc. (61-4)
www.nhm.ku.edu/~fungi

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 past mycologists, 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 Don Natvig at dnatvig@gmail.com.

March 12-17, 2013

The 27th Fungal Genetics Conference
Asilomar Conference Center
Pacific Grove, CA

<http://www.fungalgenetics.org/2013/pages/program.shtml>

May 14-19, 2013

31st New Phytologist Symposium
on Orchid symbioses: models
for evolutionary ecology
(14-16 May 2013)

<http://www.newphytologist.org/orchid/default.htm>

5th International Orchid Workshop
on Orchid population dynamics
(17-19 May 2013)

<http://www.iow2013.it/>

Aug. 10-14, 2013

Mycological Society of America with
the American Phytopathological Society
Austin, TX

Aug. 14-19, 2013

International Marine and Freshwater
Mycology Symposium (IMFMS)
Beijing International Convention Center
People Republic of China

Aug. 25-31, 2013

10th International Congress
of Plant Pathology
Beijing, China

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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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.

MSA Sustaining Members 2013

The Society is extremely grateful for the continuing support of its Sustaining Members. Please patronize them and, whenever possible, let their representatives know of our appreciation.

Fungi Perfecti

Attn: Paul Stamets
PO Box 7634
Olympia, WA, 98507
(360)426-9292
info@fungi.com

Mycotaxon, Ltd.

Attn: Richard P. Korf
PO Box 264
Ithaca, NY, 14851-0264
(607) 273-0508
info@mycotaxon.com

Triarch, Inc.

Attn: P.L. Conant - President
PO Box 98
Ripon, WI, 54971
(920)748-5125

Sylvan, Inc.

Attn: Mark Wach
Research Dept Library
198 Nolte Drive
Kittanning, PA, 16201
(724)543-3948
mwach@sylvaninc.com

Syngenta Seeds, Inc.

Attn: Rita Kuznia
Dept Head, Plant Pathology
317 330th Street
Stanton, MN, 55018-4308
(507) 663-7631
rita.kuznia@syngenta.com

Genencor Internation, Inc.

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