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July 15, 2010

Deadline for submission to *Inoculum* 61(4)

June 28-July 1, 2010

MSA Meeting
University of Kentucky
Lexington, KY, USA

August 1-6, 2010

9th International Mycological Congress
Edinburgh, UK

November 29-December 02, 2010

VI Brazilian Mycological Congress
Brasília, Brazil

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FungalDC: a database on fungal diversity in culture collections of the world

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Summary

FungalDC (Fungal Diversity in Culture Collections) is a new database aiming to gain insight into the fungal diversity held in culture collections around the world, 18814 names of fungal species/variants from GenBank, and 16843 genera from the Dictionary of the Fungi. Due to the fact that its underlying data sources are constantly updated, the database remains under constant change. A special format was developed to make it possible to (a) perform real-time tracking to determine to what extent diverse fungal groups have been studied by molecular methods, and (b) identify type material of a particular species among the specimens studied. Each species name in the database is listed using the orthography of Index Fungorum and has its corresponding higher rank taxa indicated according to data from AFTOL (CABI). The database is available to interested users at the website of VKM.

Introduction

Assembling databases of species names of living organisms, their descriptions, habitats, and relevant genetic information constitutes one of the fields of bioinformatics (<http://ru.wikipedia.org/wiki>). The use of specialized software makes it possible to search, visualize, and analyze information, as well as, more importantly, to make it accessible to other users.

Fungi represent a kingdom of living organisms of which the diversity is extremely high. At present, the Index Fungorum database lists over 454202 species of fungi that have ever been studied or used by researchers (www.indexfungorum.org). Molecular studies are of considerable importance for confirming the taxonomic status of an individual species and for describing newly defined species names. It is common knowledge that GenBank (www.ncbi.nlm.nih.gov/genbank) makes it possible for any researcher to input information on sequences of biological specimens, which then become publicly available and may be analyzed. The volume of GenBank increases rapidly; the number of sequences deposited actually doubles every 18 months (Benson et al 2009). This database currently lists about 1.7 million sequences of fungi.

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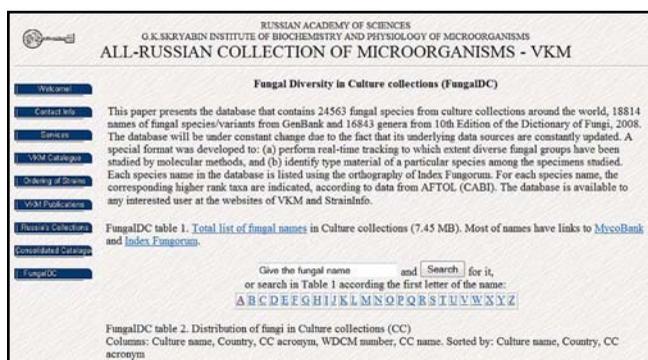


Figure 1.

In many cases, results of molecular studies allow scientists to discern new species and variants or, conversely, to demonstrate that the same species is known under two or more names (some of which are then resolved as synonyms). In this respect, it is worth noting the particular importance of the concept of name-bearing type, which forms the base for the original description of a species name. Authors list all diagnostic characteristics of a newly discerned taxon, based on studies of the corresponding type specimen. Its strain number and corresponding Biological Resource Center (BRC) must be indicated in the publication where the new species is described. This makes it clear that molecular studies of type specimens are critical in redefining the nomenclature of taxa (Agerer et al 2000, Hawksworth 2004). Such studies require that type specimens are accessible, most of which are stored in specialized herbaria in the case of fungi, whereas cultures of microscopic fungi isolated from type specimens (ex-type cultures) are maintained in specialized collections of pure cultures. Many of these BRCs throughout the world are registered in the World Data Centre for Microorganisms (WDCM), a database service of the World Federation of Culture Collections (WFCC), which contains information on the existence of BRCs worldwide and on the species maintained (<http://wdcm.nig.ac.jp/hpcc.html>).

Experimental/Materials and methods Construction of FungalDC

We aimed at assembling a database for fungi, which would include information on the following subjects:

- species diversity of fungi in world collections (according to WFCC, available hardcopy or electronic catalogs of various collections, and published lists of fungal cultures maintained in individual laboratories);
- type cultures (ex-type cultures) for species and variants maintained in world collections (according to StrainInfo and catalogs of various collections);
- molecular studies of fungal taxa (filamentous fungi and yeasts) - taxonomic diversity of fungi in GenBank NCBI;
- risk groups assigned to filamentous fungi and yeasts in accordance with classifications adopted in various countries and international organizations (in compliance with international standards and regulatory documents of individual countries).

As a result, we assembled a new database, which integrates species diversity of GenBank with the classification of higher taxa and information on the availability of type cultures in world collections. A special format was developed, making it possible to (a) perform real-time tracking to determine to what extent diverse fungal groups have been studied by molecular methods, and (b) identify type material of a particular species among the specimens studied.

There are three tables in this database:

- **WFCC-all:** contains information about diversity of fungal species in the Culture Collections,
- **Genbank:** contains information about diversity of fungal species in GenBank,
- **Taxon Fungi** contains the latest data about the taxonomic hierarchy from Index Fungorum and the Dictionary of the Fungi (10th Edition, 2008).

Some additional queries make it possible to see the data structure:

- CC_code-nsp - acronyms of culture collections, their names, the number of fungal species in each,
- CC_code-spu - the last column - the species names of fungi in culture collections,
- CC_nsp - the first column - the genera names in culture collections of the world, the second column - the number of species in each genus,
- CC_spu - the second column - the species names of fungi for each genus,
- CC_sparu - the species names and names of variants/form/form specialis,
- CC_nspvar - like CC_nsp, but with variants/form/form specialis,
- Country-CCu - acronyms of culture collections for different countries,
- Country-nCC - number of culture collections in each country,
- Country-nsp - number of fungal species, maintained in culture collections of each country (without variants/form/form specialis),
- Country-spu - list of fungal species, maintained in the culture collections of each country,

Figure 2.

Continued on following page



Figure 3.

- Gen_nsp, Gen_spu - like CC_nsp and CC_spu, but based on the GenBank info,
- Gen-Tax - Taxon info for the strains in GenBank - up to genera, with the number of species in each,
- CC-Tax - the same but for culture collections,
- CC-Tax-Gen and Gen-CC-Tax - compare the numbers of species in culture collections and in GenBank (Gen-CC-Tax - for all the records in GenBank, CC-Tax-Gen - for all the records in culture collections),
- CC-Tax - the UNION of CC-Tax-Gen and Gen-CC-Tax.

Thus, the database FungalDC (Fig 1) gets information in real-time for each fungal species (Fig 2) by linking to important information sources such as Index Fungorum (Fig 3), MycoBank (Fig 4), GenBank (Fig 5) and StrainInfo (Fig 6). The last information database allows the user to quickly find information on the whereabouts of a certain type of culture in the various culture collections (Fig 7). The database contains 23107 fungal species from 260 culture collections around the world, 18814 names of fungal species/variants from GenBank, and 16843 genera from the Dictionary of the Fungi (Kirk et al, 2009).

In order to present the data in accordance with the updated classification, we used the nomenclature in Index Fungorum (www.indexfungorum.org/Names/Fundic.asp), which is based on the 10th Edition of the Dictionary of the Fungi (Kirk et al, 2009). Thus, for each entry of the database we were able to combine GenBank data on diversity at the level GENUS-SPECIES-VARIANT with the dictionary information at the level KINGDOM-DIVISION-CLASS-ORDER-FAMILY-GENUS. Information on the availability of type cultures for particular species was obtained from StrainInfo (www.straininfo.net). It turned out that data in these sources match each other only at the genus level (Fig. 8). Therefore, we were able to determine the taxonomic position of each genus listed in GenBank with respect to higher taxa as they are arranged in the current classification. Based on this correspondence, we analyzed all genus names (more than 3000) and 19000 fungal species currently listed in GenBank. Our analysis of the integrated data made it possible to estimate the extent to which fungal taxa of different ranks are on the whole represented in NCBI within the kingdoms Fungi, Chromista and Protista that are conventionally maintained in collections of fungi and herbaria.

Each species name in the database is listed using the orthography of Index Fungorum. For each species name, the corresponding higher rank taxa are indicated, according to data from AFTOL (www.aftol.org).

Discussion

Specific information on the availability of type cultures in a particular collection may be obtained from catalogs of these collections, some of which are accessible online. In certain cases, catalogs of several BRCs are merged into joint catalogs or connected with each other, forming networks such as BCCM, a Belgian consortium, and CABRI and a consortium from the UK (www.cabri.org). Although BRCs partially hold the same material due to multiple deposits and mutual exchanges, each BRC is an information isle on its own. Each BRC assigns its own strain number to incoming material, leading to a multitude of strain numbers referring to the same material. Therefore, if one aims at finding all information available on a given strain, all equivalent strain numbers should be used when searching. In practice, not all downstream information is found and results, such as DNA sequences, are often redundantly obtained due to ignorance of equivalent results. As a solution to this problem, StrainInfo (www.straininfo.net) integrates all existing strain numbers and corresponding Meta information and bundles this on so-called strain passport pages. Specifically, each strain has a passport page containing an error-corrected list of all known equivalent strain numbers together with additional information such as sequence and literature information. StrainInfo also offers a strain browser, giving direct access to the corresponding BRC catalog entries. Currently, more than 55 different BRCs worldwide are indexed and integrated and the integrated information is made publicly accessible through the StrainInfo web application (Dawyndt et al 2005).

A researcher redefining nomenclature of taxa should determine the extent to which it has been studied (including molecular methods) and have access to the relevant type material. The plethora of databases currently in existence allows researchers to meet both requirements; however for this, each of the databases listed below should be analyzed separately:



Figure 4.

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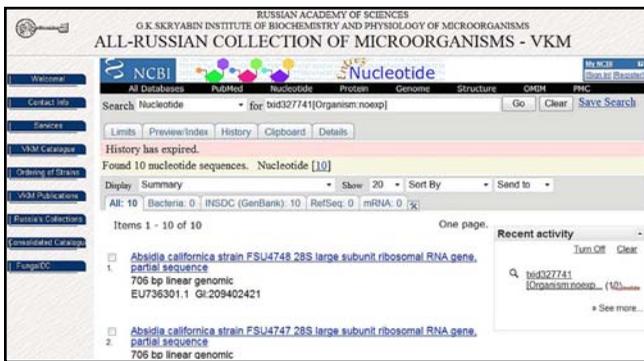


Figure 5.



Figure 6.

Fungal DC. Table2 fragment selected

<i>Absidia californica</i>	Canada	CCFC	WDCM150	Canadian Collection of Fungal Cultures
<i>Absidia californica</i>	China	CGMCC	WDCM550	China General Microbiological Culture Collectio Center
<i>Absidia californica</i>	Japan	NRIC	WDCM747	Nodai Research Institute Culture Collection
<i>Absidia californica</i>	Netherlands	CBS	WDCM123	Centraalbureau voor Schimmecultures, Fungal and Yeast Collection
<i>Absidia californica</i>	Taiwan	BCRC	WDCM59	Bioresource Collection and Research Center, Food Industry Research and Development Institute
<i>Absidia californica</i>	U.K.	IMI	WDCM214	CABI Bioscience Genetic Resource Collection
<i>Absidia californica</i>	U.S.A.	ATCC	WDCM1	American Type Culture Collection

Figure 7.

- AFTOL (contains data on the hierarchical organization of higher fungal taxa) (www.aftol.org);
- Index Fungorum or MycoBank (data on all fungal species described thus far) (www.indexfungorum.org, www.mycobank.org);
- GenBank (data on molecular–genetic studies of individual taxa of diverse organisms, including fungi) (www.ncbi.nlm.nih.gov);
- WFCC – WDCM (lists of microorganism species, including fungal species, which are maintained in world collections) (www.wdcm.nig.ac.jp);
- StrainInfo (integrates BRC catalogs) (www.straininfo.net).

Each of these databases has specific features and limitations. AFTOL indicates correspondences of taxa, from higher ranks (the kingdom Fungi) to lower ranks (individual genera), according to the most recent classification (based on the

10th edition of the Dictionary of the Fungi). Index Fungorum and Mycobank list all names of known species, including variants and specific forms that have ever been assigned to a defined genus name. Both databases provide information on authors of the original description of each taxon (from genera to species and variants) with a publication reference. Also, there is almost no data overlap (i.e., the databases complement rather than duplicate each other), which means that both should be used simultaneously.

GenBank collects data on sequences of macromolecules, to which unique accession numbers are assigned. The names of the sequenced organisms are given by the authors of the sequences within the limits of their qualification, which by no means correspond in all cases to the accepted taxonomical nomenclature. This is explicitly stated in warnings published on behalf of NCBI on each page of their database (“Disclaimer: The NCBI taxonomy database is not an authoritative source for nomenclature or classification - please consult the relevant scientific literature for the most reliable information”).

The WDCM database of the WFCC contains data on BRCs of different countries throughout the world, including their species composition in cases where the BRCs give such indications. Note that the orthography of species names in this database is original (i.e., it is the same as used in the BRC maintaining the species), which results in the appearance of multiple unique names, some of which are just misspelled names of genera and species. Nevertheless, the importance of this database can hardly be overestimated, because, in practice, it constitutes a source of data on the abundance of microbial culture stocks available worldwide.

On a more detailed level, StrainInfo makes it possible to track the transfer of microorganism cultures from the isolator to various researchers and BRCs; it also indicates type cultures for bacterial, archaeal and fungal species and provides information on the location where the culture was isolated and publication references are given for each strain. StrainInfo also provides deep links into the BRC catalogs, making it possible for users to freely traverse the corresponding catalog entries of all BRCs where a particular strain is held. However, all the options described above are currently available only for bacteria (including actinomycetes), but not or partially for filamentous fungi.

FungalDC database is under the constant change due to the fact that its underlying data sources are constantly updated. It is available to any interested user in open access at www.vkm.ru/fungalDC.htm. Subsequently, we are currently assembling data on the availability of name-bearing types of those fungal species, which are maintained solely as specimens of herbaria. This information will become available in future releases of the database.

Acknowledgements

The authors highly appreciated the valuable comments provided by Conrad Schoch (GenBank taxonomy, National Institutes of Health/NLM/NCBI, Bethesda, MD, USA), Paul Kirk (CABI Bioscience) and Gerrit Stegehuis (Centraalbu-

Continued on following page

reau voor Schimmelcultures Utrecht, The Netherlands; MycoBank). This work was supported by the program MCB of the Russian Academy of Science.

References

Agerer R, Ammirati J, Blanz P, Courtecuisse R, Desjardin DE, Gams W, Hallenberg N, Halling R, Hawksworth DJ, Horak E, Korf RP, Mueller GM, Oberwinkler F, Rambold G, Summerbell RC, Tribel D, Watling R. 2000. Open letter to the scientific community of mycologists. *Canadian Journal of Botany* 78: 981–983.

Benson DA, Karsch-Mizrachi I, Lipman DJ, Ostell J, Sayers EW. 2009. GenBank. *Nucleic Acid Research* 37: D26–D31; doi:10.1093/nar/gkn723

Dawyndt P, Vancanneyt M, De Meyer H, Swings J. 2005. Knowledge accumulation and resolution of data inconsistencies during the integration of microbial information sources. *IEEE Transactions on Knowledge and Data Engineering* 17: 1111–1126.

Hawksworth DL. 2004. 'Misidentifications' in fungal DNA sequence databanks, *New Phytologist* 161: 13–15.

Kirk PM, Cannon PF, Minter DW, Stalpers JA (Eds.), 2009. *Dictionary of the Fungi* (10th Edition). CSIRO Publishing, 640pp.

MSA BUSINESS

MSA Secretary's Email Express

MSA Council has completed five email polls since my last report, approving the following:

- MSA Full Council poll 2010-02: MSA Council approves the appointment of **Roy Halling** to the Editorial Advisory Committee.
- MSA Full Council poll 2010-03: MSA Council approves the appointment of **Mary Palm** to the Editorial Advisory Committee.
- MSA Full Council poll 2010-04: MSA Council approves the appointment of **Thomas Volk** to the Editorial Advisory Committee.
- MSA Full Council poll 2010-05: MSA Council approves request brought by Editor-in-Chief **Jeffrey Stone** that MSA join the DC Coalition "Principles for Free Access to Science" against proposed legislation by the House for the Federal Research Public Access Act, H.R. 5037 that would require final manuscripts of peer-reviewed, private sector journal articles reporting on federally funded research be made freely available on government-run websites no later than six months after publication.
- MSA Full Council poll 2010-06 – MSA Council approves the appointment of **Wendy Untereiner** as an Associate Editor of *Mycologia*.

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 2010.

United States: Sladana Ana Bec, Ester Alvarenga Santos Buiate, James Vincent Clark, Rebecca Creamer, Susan H Furr, Catherine Gehring, Matt Gordon, Michael Gruenstaedl, Alicia Grace Knudson, Leticia Kumar, Daniel Lawrence, Frank Mrema, Tara E Ness, Rodrigo Agduyeng Olarte, Stephani Pescitelli, Ravin Poudel, James Reed, Andrew J Rodriguez, Ian A Saltzman, Dylan Short, Zoe Fae Smith, Maria Fernanda Torres, Samuel Gair Tourtellot, Lane Tredway, Eric Dennis Tretter, Michael Joe Steven Vaughan.

Canada: Michelle Hubbard.

France: Jean-Michel Bellanger

Netherlands: Harald Mikkelsen



Jessie Glaeser, Secretary
(Photo by Tom Volk)

Emeritus candidates: Dr. Maren Klich, now of Crandon, WI has applied for Emeritus Status. She has been a member of MSA since 1978. Emeritus status is conferred upon retired or retiring members who have at least 15 years of good standing in the Society and will be formally approved by the Society at the Annual Business Meeting.

Deaths: We are saddened to learn of the death of Dr. Patricia Ellen Crane who passed away on April 22, 2010, at the age of 61 years. Dr. Crane was a specialist on rusts and worked for the Northern Forestry Centre of the Canadian Forest Service in Edmonton, AB and was also associated with Ensis Forest Biosecurity and Protection in Rotorua, New Zealand. She is survived by her husband, children and grandchildren.

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. In our email blast to MSA members for the election, over 130 email addresses were found to be invalid necessitating the costly mailing of hard copy ballots. 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. Please remember to renew your membership for 2010! In recent years we have suffered an alarming decline in membership and it would be wonderful to reverse this trend. The first step is for everyone who is currently a member to renew for the upcoming year. And don't forget to recommend MSA to your professional colleagues who are interested in fungi – be they pathologists, geneticists or ecologists. There is room in MSA for all!

—**Jessie A. Glaeser**
MSA Secretary

MYCOLOGICAL NEWS

Patricia Ellen Crane

We note the passing of Patricia E. Crane, from Edmonton, Alberta, Canada, on April 22, 2010. Her major mycological research efforts dealt with rust fungi, including several papers during the last decade. Pat Crane accepted a two-year post-doctoral position at Scion (New Zealand Forest research Institute Ltd) commencing in late 2004. The research topic was the flute canker disease of *Pinus radiata* caused by *Neonectria fuckeliana*, of which

she studied the basic biology and epidemiology. Subsequently, she returned to Canada and rejoined her family. Her later publications appeared in *Mycologia*, *Mycological Research*, *Mycoscience*, *Canadian Journal of Botany*, *New Zealand Journal of Botany* and *Canadian Journal of Forest Research*.

Ron Petersen
Chair, Memorials Committee
repete@utk.edu

2010 MSA Auction

It's never too soon to think about donating your mycological treasures to the 2010 MSA Auction!

Out-of-print mycology books, historical photographs of mycologists, and photos and illustrations of mushrooms and other fungi are always popular – and creative items ranging from mycological t-shirts to art, utensils, research tools, and myco-kitsch are more than welcome. Remember that auction proceeds go to the MSA General Endowment Fund, which supports student fellowships and travel to meetings.

Please notify Betsy Arnold (arnold@ag.arizona.edu) of the items you plan to donate so that we can compile a

catalog. Donated items may be delivered to the meeting registration area or given to Betsy at the start of the conference – or mailed Lisa Vaillancourt at the address below.

Lisa J. Vaillancourt (MSA AUCTION)
Department of Plant Pathology
201F Plant Science Building
1405 Veterans Drive
University of Kentucky
Lexington, KY 40546-0312

Looking forward to seeing you at the auction on July 1st!

Betsy Arnold
Chair, MSA Endowment Committee
arnold@ag.arizona.edu

O. K. Miller Library Books for Sale

I am currently selling all of Dr Orson Miller's shelved books, reference books, journals, thesis and books written by Orson himself. There are about 750 books. For a complete list see the link at www.mushrooms-millers.com. If you would like any of the books please contact me at

orsonk@frontiernet.net. Please include what you would spend for each volume. I will also need postage. A percentage of the income will go to the MSA Endowment Fund.

Hope Miller (Mrs. O. K. Miller Jr.)

Myxomycete Request

The 2010 Mycological Society of America Annual Foray will be held at Bernheim Forest in Bullitt County, Kentucky where no voucher myxomycete collections have been published. Our ongoing study of Myxomycetes of Kentucky began in 1977 and still continues with several possible new species that require additional collections.

Please bring any myxomycete collections you have made in Kentucky to the foray and share any made on June 27 that will help us document a more complete myxomycete survey for Kentucky.

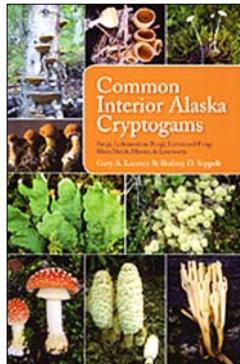
Harold W. Keller (Dr. Myxo)
KELLER@UCMO.edu

MYCOLOGIST'S BOOKSHELF

Nine books are reviewed in this issue—many thanks to all the terrific MSA reviewers! Five new books have been received since the last Mycologist's Bookshelf and three of them need reviews. 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. Amy.Rossman@ars.usda.gov.

Common Interior Alaska Cryptogams

Common Interior Alaska Cryptogams, Fungi, Lichenicolous Fungi, Lichenized Fungi, Slime Molds, Mosses, & Liverworts. 2009. Gary A. Laursen, Rodney D. Seppelt. 2009. University of Alaska Press, PO Box 756240, Fairbanks, AK 99775, fyppress@uaf.edu, 1-888-252-6657, fax: 907-474-5502, ISBN 978-1-60223-058-3-pbk. 218 pp, 338 color figs, 113 b&w figs. Price: \$26.95.



This book has a wealth of information that includes much more than the typical field guide available at a bargain-basement price. The front cover has a durable glossy lamination that will protect it from rain, liquid spills, and wear and tear in the field. The spine is Smythe sewn and wrapped with a 260-gsm C2S stock to ensure against the pages falling apart. The smaller size will facilitate carrying this book in hand while picture keying field collections.

Topical headings include a brief Introduction and Interior Landscapes along with striking color vistas and landscape images. A history of the Denali National Park and Preserve and Mount McKinley, North America's highest mountain at 20,320 feet, provides the setting for this vast area. Additional sections such as Fungal Ecology, Mushroom Architecture with excellent line drawings representing mushroom morphological terminology, Where to Look for Fungi, Forest Fungi, Treeline Fungi, Tundra Fungi, Riparian Fungi, and Disturbed Area and other Specialized Habitat Fungi also have lists of cryptogams found in each of these ecological habitats. These species-habitat associations represent valuable additional ecological information that increases the chances of collecting certain cryptogams. Under the broad rubric of "cryptogams" the following groups are included with species descriptions and illustrations and the number of taxa given in parentheses: gilled fungi (80); gasteromycetes (5); rust, jelly, cup, earth tongue (12); lichenicolous fungi (22); lichens (18); plasmodial slime molds (11); mosses, liverworts, and hornworts (43). The following information is given for each species listed: Family, Genus and Species, Common Name, Striking Field Characters, Macro and Micro Description, Habitat and Role, Edibility, Taste, and Odor.

This book lacks keys to the general groups or to orders, families, and genera. Therefore as a picture guide the color images

should be of high resolution, true color rendition of high quality, and appropriate magnification and depth of field to show external morphological detail. Unfortunately many color images are undersized approximately 2 5/16" x 1 1/2" to take less space on the page and the colors are washed out and lack sufficient magnification to show characteristics close up, as for many of the lignicolous fungi, lichens, and bryophytes. In contrast, the close up color image of the myxomycete *Perichaena minor* showing the stalked sporangia with dark peridial warts is one of the best photographs of this species ever published. The photo credits are attributed to six people but not associated with specific color images as in most publications. The line drawings that illustrate some of the moss species show the microscopic cell patterns of the leafy gametophytes and structures of the sporophytes.

Another field guide titled "Alaska's Mushrooms, A Practical Guide" by Harriette Parker includes 34 species of edible and poisonous species illustrated with color images. However, this pocket book is only 94 pages and was intended more for the beginning mushroomer, and, while there is overlap, some of the species illustrated are not present in *Common Interior Alaska Cryptogams*. The latter book should appeal more to the professional mycologist and experienced field collector of cryptogams.

The extensive glossary of terms pages 181-194 will aid the collector in understanding the species descriptions. The references cited on pages 199 to 204 include broad coverage of all of the fungal groups but several monographs on the myxomycetes, mosses, and liverworts would have been valuable additions. The Appendix has a valuable section titled Mycological Reagents: Makeup and Use that mainly targets macrofungi. The Index to Species is arranged alphabetically by families, genera, species, and common names.

Alaska represents a relatively unexplored vast area and this book helps to fill a void for groups of organisms where little is known. The content of this book will be of utmost interest to outdoor professionals in the forest service, summer visitors, and nature enthusiasts who wish to learn more about the wonders beneath their feet in the land of the midnight sun. The authors are truly trail blazers who have increased our appreciation for the role of cryptogams in one of the last frontiers in North America.

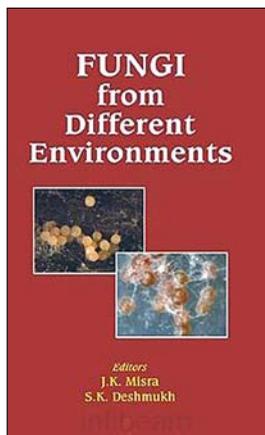
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Fungi from Different Environments

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.

This book is the first in a planned series of four books on fungi from different environments. This first book comprises 14 chapters “written by experts in their ... area of specialization”. Chapter one is on fungi from palaeoenvironments, chapter two is on fungi in the air, chapter three covers fungi in saline water, chapter four covers fungi in the marine environment, chapter five is on the genus *Achlya* from polluted aquatic environments, chapter six covers keratinolytic and keratinophilic fungi in sewage sludge, chapter seven discusses psychrophilic molds, chapter eight discusses “ammonia fungi”, chapter nine covers research on novel enzyme activities and their genes in fungi from extreme environments, chapter 10 discusses the cuckoo fungus, chapter 11 is on hallucinogenic mushrooms, chapter 12 covers environmental impacts and fatty acid composition, chapter 13 deals with *Microsporium canis*, and chapter 14 is on thermophilic molds and environmental management.



The book purports to be written by experts in their field and to collate the current advancements and research on fungi in differing environments. This is misleading as none of the “experts” are well known mycologists and none are from the US or UK; the majority of the authors being from India and Japan, with the others from Slovenia, Australia, Ukraine, Mexico, Israel, Italy, Poland and China. Also many of the chapters are written specifically about the fungi in that particular environment in a specific country (typically India) and not worldwide.

The book is not well written. Most of the chapters have not been proofread or corrected for appropriate English grammar. As such it is a difficult book to read and at times it is hard to even understand what is actually being said. For the most part the chapters are mini reviews of fungi in specific environments – and often in a specific country – but they are not thorough or complete, and as such are disappointing. Additionally many of the chapters are not well referenced and many claims are made without citations.

The idea behind the book – to collate the current advancements and research on fungi in different environments – is an excellent one, but it fell far short of its claims and goals. Regrettably, I would not recommend this book.

Jinx Campbell

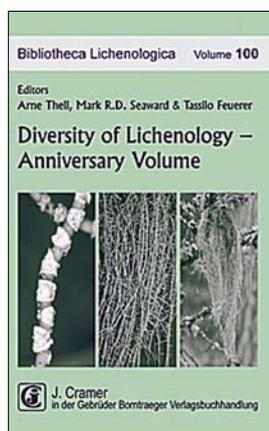
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Diversity of Lichenology

Diversity of Lichenology – Anniversary Volume. 2009. Arne Thell, Mark R.D. Seaward, Tassilo Feuerer (eds.). Schweizerbart'sche Verlagsbuchhandlung, www.schweizerbart.de. ISBN 978-3-443-58079-7. Bibliotheca Lichenologica 100: 1–512. Price: €124.

This edition of *Bibliotheca Lichenologica* is the 100th volume of the series and is dedicated to Dr. Volkmar Wirth, a celebrated lichenologist from Germany. Wirth's contributions to lichenology number over 140 publications from 1969 to present including a paper in this volume. Wirth has been editor of this periodical since 1983.

The one-hundredth volume includes new research in the areas of updated phylogenies of larger groups of lichens, taxonomy, ecology, floristics, and photobionts of the lichen-forming fungi. The papers were submitted by an impressive number of lichenologists, mainly from Europe. Several of the papers focus



on lichens found in understudied regions of the Continent. The colored photography in this issue adds to its value, clearly defining characters found in the taxonomic submissions. This book will be a wonderful reference for the taxonomic literature of lichens.

Of particular interest is the phylogenetic analyses of fungal families in Ascomycota, specifically Lobariaceae, Teloschistaceae, Thelocarpaceae, and Vezdaeaceae. These papers help to clarify relationships between lichen species within the families. Fedorenko, Stenroos, Thell, and Kärnefelt describe their phylogenetic analysis of xanthorioid lichens in Teloschistaceae, examining over 200 specimens from 50 genera, and looking at the ITS and mtSSU sequences. Högnabba, Stenroos, and Thell explain phylogenetic relationships and evolution of photobiont associates in Lobariaceae, including a number of taxa from the southern hemisphere. The phylogenetic position of ephemeral lichens in the Thelocarpaceae and Vezdaeaceae are examined by Lumbsch, Zimmermann, and Schmitt. The placement of *Thelocarpon* and *Vezdaea* does not appear to be in Lecanoromycetes, but a closer association with Pezizomycotina.

Clarification in lichen taxonomy is presented in two papers. Kondratyuk, Kärnefelt, Elix, and Thell discuss contribu-

Continued on following page

tions to the family Teloschistaceae, with particular references to the Southern Hemisphere – thirty-five new species are described. A key to European species of *Usnea* by Randle, Tõrra, A. Saag, and L. Saag presents 32 species with short descriptions, a key, images, and maps.

Lücking, Rivas Plata, Chaves, Umaña, and Sipman offer a paper describing how to estimate the number of tropical lichens that could potentially be found on a world-wide basis. A calculation of 28,000 species is based on species-area relationships.

Other important papers include contributions by Aptroot on the genus *Traponora*, Hafellner on the genera *Phacographa* and *Phacotheicum*, Knudsen and Kocourková studying three species of *Polysporina*, Bültmann and Daniëls examined lichen and vegetation relationships with a focus on the *Thamnotium vermicularis* microcommunity, Harutyunyan and Mayrhofer on the lichens of Armenia, Hansen and Hasholt discuss the radial growth of twenty-two epilithic lichens on south-east Greenland, Schiefelbein on the maritime lichens of the Baltic Sea, and several other topics of interest.

Of particular interest is the paper by Ingvar Kärnefelt entitled “Fifty influential Lichenologists”. This piece provides short biographies of the lichenologists from past to present. Starting with Simon Schwendener in the 1880s, who is credited with

discovering the lichen symbiosis, the paper takes you to prominent Lichenologists who are doing ground-breaking work in lichen phylogenetic, taxonomy and floristics of understudied regions of the world. If your favorite lichenologist is not mentioned, you might find them in one of the many pictures of lichenologists.

This anniversary volume of *Bibliotheca Lichenologica* is one that would be of interest to any lichenologist and mycologist wanting to complete the set of this publication. This volume gives us a better understanding of lichen taxonomy and floristics. For mycologists, the papers focusing on lichen-fungal phylogenies add insights into the Division Ascomycota. The ecological papers provide methodologies that could be useful to anyone involved with fungal vegetation studies.

This volume will be a collector’s choice to any mycologist and certainly lichenologists. The papers are well written and offer useful insights into what is currently known about several areas of lichenology.

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Checklist of the Lichens and Lichenicolous Fungi of Greece

Checklist of the lichens and lichenicolous fungi of Greece. 2009. Bernard F. M. Abbott. J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, D-14129 Berlin, Germany, mail@schweizerbart.de. Bibliotheca Lichenologica No. 103. ISBN 978-3-443-58082-7. Pp. 368. Price: €94.

Although the first records of lichens from Greece extend back to Theophrastus and Dioscorides in classical times, Greece is unusual in Europe in not having ever had a comprehensive checklist compiled or even many detailed regional studies of lichenized fungi. This is a consequence of the lack of a resident lichen systematist employed in any institution in the country. Now, Bernard Abbott, a British ex-patriot who has lived in Arkadias, Greece, for many years, has compiled a comprehensive survey of previous reports from the dispersed literature and supplemented this by the results of 10 years of his own extensive but otherwise unpublished studies in the Peloponnese. The result is a checklist in which 1296 species are accepted, and omits a further 169 as erroneous or otherwise doubtful. But this is much more than the usual naked checklist, as each species entry has information on synonyms used, references to published reports, and localities where they are found. The detailed report given for even the commonest species is unusual, thus accounts for single species may extend for more than a page. Such a level of information is hardly found outside computerized databases today. The taxonomy is generally up-to-date, although I regret that the system in use for parmelioid lichens is not fully adopted as “there have been too many changes to genera in the *Parmeliaceae* in the last 40 years, many of them ill-advised”. I could not agree more with that statement, but the difference with the latest changes is that they have a molecular

basis and can be expected to “stand the test of time” he desires.

The reports are arranged by province or island names for Crete and Evia, with Crete and the Peloponnese having the most species at 649 and 591. Least studied is Thrace with a mere 32 records. It is clear that there is much still to be done, not the least for lichenicolous fungi of which there are few reports. Bernard estimates that the total “can be expected to exceed 1500 taxa” – a figure which I suspect will eventually be proved to be too low.

The core of the work is preceded by a detailed historical account of lichenological studies in the country and followed by a cross-indexed list of synonyms, notes on Greek place names including results from detective work on those mentioned in earlier literature, a list of his own collecting localities, 18 pages of references cited, and, unusually, two pages of works not seen.

This meticulously, and clearly lovingly, prepared work can be expected to promote interest in Greek lichens – especially if it could also be made available online through LIAS (A Global Information System for Lichenized and Non-Lichenized Ascomycetes; www.lias.net) to complement the national lists already available through that site. It now needs to be supplemented by a substantial handbook with photographs to further stimulate Greek nationals, and others settling there, in the nation’s lichens. And, of course, all lichenologists taking a holiday in the Aegean will need to have this book at hand to see what additions they can make – and let Bernard know (linda-in-arcadia@hotmail.com).

David L Hawksworth

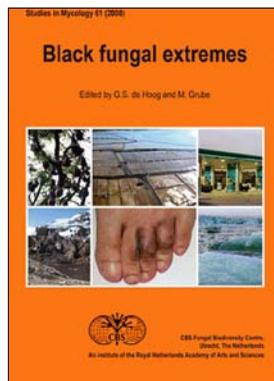
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Black Fungal Extremes

Black fungal extremes. 2008. G.S. de Hoog, M. Grube (eds.). Centraalbureau voor Schimmelmelcultures, P.O. Box 85167, Utrecht, The Netherlands, www.cbs.knaw.nl/publications/index.htm. *Studies in Mycology* 61: 1-194. Price: €60.00.

Wow-what an exciting book! From salt pans in the Netherlands to rocks in Antarctic deserts, the fungi have proven amazing colonists in otherwise biologically bleak circumstances and this volume gets down to some great details and lots of suggestions for future research. *Black fungal extremes* is a fascinating collection of research papers on the biology and phylogeny of dematiaceous micro-fungi that inhabit extreme environments or are human pathogens. This series of papers is an outcome of two Working Groups of the International Society for Human and Animal Mycology. One working group titled "Black Yeasts" met in Graz in 2006, and another group titled "Chromoblastomycosis" met in Utrecht in 2007, representing participants from 19 countries. One of the more outstanding features of this collection is the interdisciplinary nature of most of the papers. A single paper may include research into the ecology, biochemical pathways, taxonomy of a fungus, with phylograms to compare the ecology and biochemistry of the fungus at hand with a larger consort.

As the Preface points out, early mycologists used dark coloration as a convenient way to separate groups of species, and today the term "dematiaceous" is used to refer to dark colored hyphomycetes. Today we know dark coloration alone is not phylogenetically significant. The dark colors are known to be or in many cases presumed to be DHN-like (dihydroxynaphthalene) melanins, which is the topic of a num-



ber of papers dealing with the biochemical characterization and functionality of these pigments in the fungi. There is extensive coverage of biochemical pathways to melanin production as well as its role in cellular metabolism and in regulation of protein synthesis.

It is shown in many papers that melanins are critical to fungal adaptation in extreme environments, providing protection from UV rays, high temperatures, and in some species affecting the functionality of cell membranes in high saline environments. Black, extremophilic fungi are also used in the fledgling science of Astrobiology, comparing their capabilities of surviving in rocks in the harsh Antarctic environments to the possibilities of survival in outer space and on the fourth planet, Mars, should they be transported there from Earth. Understanding their biology may aid in our ability to optimally seek out extraterrestrial life on other planets.

Several genera and species new to science are described as well as an extensive use of phylograms to discuss relationships between black fungal extremophiles and their less melanized relatives. The latest on *Aureobasidium* and its new varieties is given as well as the new genera *Elasticomyces* and *Recurvomyces* are described. The latter two are inhabitants of ice-free Antarctica, one of the coldest and driest environments on Earth. I applaud the subtle use of color in most phylograms to point out assemblages of interest, and especially the use of icons to indicate habitat or timescales.

The printing and page quality of this paper-bound volume are excellent. The use of color is well mastered and done in a thoughtful manner especially in illustrations. The binding is glued and the cover also sewn onto the body.

I heartily recommend this volume; it really sets the mark for excellent interdisciplinary work in mycology and research topics we have yet to even begin to fully understand.

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Microstructures of Vegetative Mycelium of Macromycetes. . .

Microstructures of Vegetative Mycelium of Macromycetes in Pure Cultures. 2009. Asya Buchalo, Oksana Mykchaylova, Margarita Lomborg, Solomon P. Wasser. Edited by Paul A. Volz and Eviatar Nevo, Alterpress, Kiev, Ukraine. ISBN-13: 978-966-542-408-6. 224 pp. Price: €96.00.

Traditionally, mycologists who work with macrofungi such as agarics and the larger ascomycetes have relied on characteristics of the sporocarps for classification and identification, the general feeling being that the vegetative mycelium had few characters available for such purposes. Is there reason to change that way of thinking? Perhaps.

This is an atlas of mostly SEM images of the cultured vegetative mycelium of 100 species of edible and/or medici-

nal macrofungi, accompanied by written descriptions of the mycelium and sporocarps. Nearly half of the species illustrated come from the six (as the authors assign the species) genera *Agaricus* (19), *Coriolus-Trametes* (3), *Leucoagaricus* (3), *Morchella* (7), *Oudemansiella-Xerula* (3), and *Pleurotus* (9). The strains are maintained at the Culture Collection of Mushrooms at Kiev, Ukraine, and the authors have dual associations with the M.G. Kholodny Institute of Botany, National Academy of Sciences of the Ukraine and the Institute of Evolution, University of Haifa, Israel.

The front matter includes short introductions from the editors and authors and a brief list of abbreviations/acronyms. Chapter I describes the importance of the work and the meth-

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ods used. It then introduces the features that the authors have found to be useful in characterizing the vegetative mycelium of different species such as type of branching, cell-wall thickness, surface features of hyphae e.g., crystals, bristles, swellings, and bulbs, coiling of hyphae, nature of mycelial cords, clamp connections e.g., presence, abundance, size, and shape, and presence and form of conidia.

Chapter II comprises the descriptions. They are arranged alphabetically and each one includes the name of the fungus with authority and an indication of its family and phylum. In some cases, a commonly recognized synonym is provided, but generally synonyms are not listed. A brief description of the vegetative mycelium as it occurs in pure culture is next, followed by a longer description of sporocarp macro- and micro-features and ecological occurrence. The descriptions end with an indication of the species' practical use, such as being of culinary or medicinal value.

Chapter III includes the illustrations, printed four-per-page on heavy glossy stock; the rest of the book is printed on lighter-weight, non-glossy stock. Altogether there are 414 images, so roughly four per species. Most are good-quality SEMs of hyphae showing morphology, surface features, or clamp connections. Also included are several drawings of hyphae and Petri dish photographs of cultures. The reference list and species index appear between Chapters II and III, presumably to facilitate printing on two different stocks.

Because the authors observed a great deal of diversity in mycelial characteristics, they feel that some of the features could be taxonomically useful. My perusal of the images in-

dicates that they may be correct. However, the situation here reminds me of that of identifying fungi on the basis of the morphology and anatomy of ectomycorrhizas they form. It takes a lot of work and experience to do the latter, and not all species are sufficiently distinctive for it to work in every case. Thus, most workers probably would opt for molecular approaches to classification and identification of cultures. In a way this disappoints me, as I have great admiration for those who have developed the personal skill necessary to use a morphological/anatomical approach and, in doing so, acquire, as Nobel-laureate Barbara McClintock would say, "a feeling for the organism."

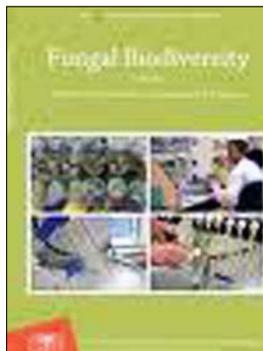
Although it is obvious the book was not written by native English-speakers, I did not encounter any instances where this created a problem in understanding. It contains many typographical errors but, again, this did not impede understanding – it was merely an annoyance. The binding, paper quality, and so forth all are good.

The publisher did not provide cost and ordering information with the book and I was unable to track Alterpress down on the internet. I did find that, as of early April 2010, it could be ordered from Koeltz Scientific Books for €96 / \$139.20 (www.koeltz.com). At this price, I suspect most workers will rely on their institutional libraries to acquire it.

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CBS Laboratory Manual Series 1: Fungal Biodiversity

CBS Laboratory Manual Series 1: Fungal Biodiversity. 2009. P.W. Crous, G.J.M. Verkley, J.Z. Groenewald, R.A. Samson (eds.). Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, www.cbs.knaw.nl/publications/index.htm. ISBN: 978-90-70351-77-9. 269 pp. Price: €50.00.



This manual is the first in the new "CBS Laboratory Manual Series" published by CBS-KNAW Fungal Biodiversity Centre (Centraalbureau voor Schimmelcultures). Although P.W. Crous, G.J.M. Verkley, J.Z. Groenewald, and R.A. Samson edited this book, there are 12 other scientists who contributed to the different sections. This manual covers the fundamentals of systematic mycology with emphasis on culturing techniques for the different groups of fungi (Ascomycota, Basidiomycota, Chytridiomycota, and Zygomycota) and fungal-like organisms (Hyphochytriomycota and Oomycota). As mentioned in the Abstract, the book was created as a general text based on a mycology course imparted at CBS-

KNAW every year. The book first gives a short (1/2 page) introduction to "What are Fungi?" followed by another short section on "How to study Fungi."

The introduction in the second chapter (The Fungal System, 4 pp.) mainly covers species concepts in fungi and a list of general mycology literature and journals. The second chapter also includes information along with laboratory and culturing techniques for Chromista (Hyphochytriomycota, ca. ¼ page; and Oomycota, ca. 10 pp.), Chytridiomycota (4 pp.), Zygomycota (10 pp.), Ascomycota (96 pp.), and Basidiomycota (14 pp.). Each of the sections for each taxonomic group is beautifully illustrated with color photographs and line drawings. The line drawings and photographs illustrate life cycles and anatomical features of the major taxonomic group and representative species. Some photographs show the appearance of the colony, especially for members of the Ascomycota. In each of the species pages, there is information on morphological characteristics of anamorphs and teleomorphs, culturing techniques, illustrations as both photographs and line drawings, and references.

The third chapter, General Methods (11 pp.), gives information on working aseptically, safety issues, culturing techniques including single-spore isolations, preparation of

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media, microscopic examination, electron microscopy, growth studies, preservation of living cultures and herbarium specimens, and public culture collections. The photographs illustrating the techniques and steps for microscopic examination are excellent. Chapter IV, Molecular and Phylogenetic Methods (20 pp.), describes and illustrates in good detail the methods that will ultimately produce a phylogenetic tree. These methods include genomic DNA extraction, polymerase chain reaction (PCR), gel electrophoresis, automated sequencing, nucleotide BLAST search, and phylogenetic analyses including alignment, tree reconstruction, and interpretation of results. This chapter also mentions CBS's DNA Bank, which stores genomic DNA of ex-type strains and other important reference strains, and DNA barcoding.

The last chapters of the manual deal with nomenclature (Chapter V, 3 pp.), definitions and methods for studying different "ecological groups of fungi" (Chapter VI, 11 pp.), methods in applied mycology (Chapter VII, 9 pp.), a glossary

(Chapter VIII), 63 recipes for mycological media (Chapter IX), a list of references used in the book (Chapter X), arrangement or classification of the major fungal taxa (Chapter XI), and an Index (Chapter XII).

Although this manual may be slightly advanced for complete beginners or for an introductory mycology course, it is a very complete laboratory manual for those interested in fungal systematics. The section on Ascomycota is especially extensive and detailed. It is beautifully illustrated and the methods are described thoroughly. The inclusion of a chapter on Molecular and Phylogenetic Methods (Chapter IV) is particularly compelling and innovative for a laboratory manual. I am sure the mycological community will be anxiously awaiting the next in this series of laboratory manuals from CBS.

Priscila Chaverri

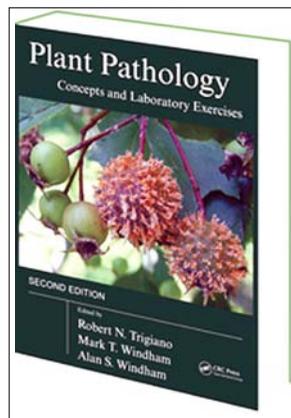
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Plant Pathology. Concepts and Laboratory Exercises

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.

This book has been updated with recent and revised information in the field of plant pathology to produce a very useful tool for students and researchers in this field. This Second Edition has been enlarged (xvii + 558 pp in Second Ed. versus 432 pp in First Ed.). It includes among others: concepts and terms in plant pathology, case studies, and laboratory exercises.

This valuable reference, divided into six primary parts and 42 chapters, is a comprehensive coverage of basic concepts in plant pathology including historical perspectives, definitions of disease, and fundamentals for understanding disease relationships with the environment, organisms that cause disease (viruses, prokaryotic organisms, plant parasitic nematodes, fungi, plant parasitic seed plants, including other biotic and abiotic diseases). Plant-pathogen interactions are explained as well as basic ideas of epidemiology, control strategies, and disease diagnosis. Each theme is introduced with a theoretical background addressed by experts in that field. Main ideas and concepts are highlighted at the begin-



ning of each chapter providing the background for laboratory exercises, which are the core and main importance of this book. Laboratory exercises are divided into one or several experiments oriented towards beginning and/or advanced students, each focused on different aspects. For each experiment, a detailed list of materials needed are described, a protocol is carefully outlined with detailed instructions (Procedure), and sections are provided such as Anticipated Results, Questions, and Literature Cited (in some places cited as "references").

The book uses an informal language and technical terms are used as necessary. This makes the book understandable for students of all levels. For teachers and instructors, laboratory exercises constitute an invaluable tool for explaining concepts, principles, and giving a sound basis in plant pathology. References are given at the end of each chapter and these are kept to a minimum. New additions to the Second Edition include five new topics addressed by experts in each subject and exercise chapters. Topics include soilborne pathogens, molecular tools, biocontrol, plant-fungal interactions, and in vitro pathology. In addition chapters are devoted to plant pathology careers and how to use and care for the microscope. A few drawbacks can be mentioned such as the illustrations provided for the chapters of Part 2 are not of the highest quality and the use of the term pycniospore in error for pycnidiospore. Accompanying the book, there is a very useful compact disc with the figures included in the text and additional color photographs and slides.

Teresa Iturriaga

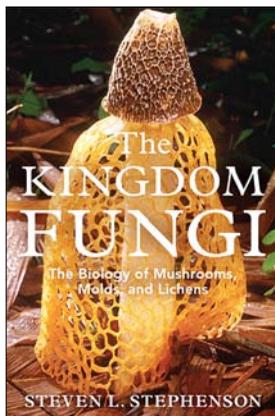
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The Kingdom of Fungi

The Kingdom of Fungi. The Biology of Mushrooms, Molds, and Lichens. 2010. Steven L. Stephenson. Timber Press, Portland, OR, www.timberpress.com. ISBN: 978-0-88192-891-4. 328 pp. Price: \$34.95.

Steven Stephenson's "The Kingdom of Fungi" begins with a general description of the fungi, which is a critical task given that this is intended as an introduction to mycology. Next is a chapter on aquatic species, including chytrids, Oomycota, and aquatic Ascomycota, followed by an ambitious roundup of the Zygomycota, Ascomycota, and yeasts (including basidiomycete yeasts) in a chapter titled, "The Most Ubiquitous of All Fungi." Subsequent chapters survey some of the sexual manifestations of ascomycete orders that dodged the "ubiquitous" banner, and separately, "Morels, Truffles, Cup Fungi, and Flask Fungi," followed by the non-yeast Basidiomycota. This presentation of fungal groups is puzzling. The ordering of material might make more sense for a book focused on the ecology of the fungi, or their morphology, but the preface promises "a basis for understanding the diversity of . . . the fungi." Diversity means different things to different people, but with much of the text concerned with taxonomic groups, the chapter-by-chapter servings of distantly related things is unnecessarily confusing.

The choice of sub-headings in the basidiomycete chapter including, "Agarics with Purple-Brown to Chocolate-Brown Spores," seems decidedly quaint. Categories based on spore color would satisfy Elias Fries and can still be useful in a field guide, but I bet few readers of *Inoculum* will be pleased. The frustration felt by some field mycologists at the violence done to traditional taxonomic groupings by molecular phylogenetic studies is understandable, but there is no doubt that this research has produced some of the most important advances in mycology



in the last 25 years. Indeed, the unfolding picture of evolutionary relationships is symbolic of a vibrant field of discovery and without it one would be justified in viewing fungal systematics as a lifeless area of inquiry that had moved nowhere since the nineteenth century. This book certainly touches upon some of the important points, but the taxonomic sections would have been more appealing if they had gone further in embracing the recent work.

Lichenized fungi are showcased after the basidiomycetes, followed by slime molds. Stephenson is a Research Professor at the University of Arkansas and has studied myxomycete and protostelid taxonomy for many years. He makes the obvious point about the non-fungal nature of these protists, as he does when dealing with the Oomycota, but I don't think that this avoids an obvious incongruity. I made a case some time ago for referring to hyphal things as "fungi" in a colloquial sense, while recognizing the quixotic nature of this stance against the beacon of ribosomal RNA alignments. The same argument can be made for some of the gooey things like myxomycetes. But even though it makes sense sometimes to refer to a straminipile as a fungus in order to avoid a distracting discourse on phylogeny, the time has come to exclude water molds and slime molds from a book titled, "The Kingdom of Fungi."

After the slime molds, Stephenson describes fungal decomposers, mycorrhizae, and plant pathogens. Interactions between fungi and non-human animals, and between fungi and humans, are treated separately, before the last chapter on fossil fungi. The book is illustrated with 124 color photographs, including lots of fruit-bodies plus some nice light micrographs. Stephenson does a good job weaving interesting facts about fungi throughout his narrative and this is the strongest element of the work. For this reason, "The Kingdom of Fungi" may serve as a useful accompaniment to a course on mycology, especially if the instructor makes frequent reference to current work on fungal systematics. Overall, this is an easy read and I would be delighted if it encouraged students to learn more about the fungi.

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Recently Received Books

- **Fungus Flora of Tropical Africa. Vol. 2. Monograph of *Lactarius* in Tropical Africa.** 2010. Annemiek Verbeken, Ruben Walley. National Botanic Garden of Belgium, available from Sales Publications Service of NBGB, Belgium. ISBN 978-907261981-5. 161 pp., 54 pl. Price: €50.00. *Review in progress.*
- **Highlights of the *Didymellaceae*: A polyphasic approach to characterize *Phoma* and related pleosporalean genera.** 2010. Maikel Aveskamp, Hans de Gruyter, Joyce Woudenberg, Gerard Verkley, Pedro W. Crous. Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, <http://www.cbs.knaw.nl/publications/index.htm>. ISBN: 978-90-70351-79-3. Studies in Mycology 65: 1-64. Price: €40.00. *Review needed.*
- **A phylogenetic re-evaluation of *Dothideomycetes*.** 2009. Conrad L. Schoch, Joseph W. Spatafora, H. Thorsten Lumbsch, Sabine M. Huhndorf, Kevin D. Hyde, Johannes Z. Groenewald, Pedro W. Crous. Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, <http://www.cbs.knaw.nl/publications/index.htm>. ISBN: 978-90-70351-78-6. Studies in Mycology 64: 1-220. Price: €65.00. *Review needed.*
- **Remarkable Biologists. From Ray to Hamilton.** 2009. Ioan James. Cambridge University Press, www.cambridge.org. ISBN 978-0-521-69918-1. 184 pp. Price: Hardback \$95.00, Softback \$45.00. *Review needed.*
- **Taxonomic Studies on Agaricales of Hokkaido, Northern Japan, with Special Reference to *Melanoleuca*, *Oudemansiella*, *Xerula*, *Volvariella* and *Pluteus*.** 2010. Seiji Takehashi, Tamotsu Hoshina, Taiga Kasuya. NPO The Forum of Fungi in Northern Japan. Sapporo, Japan, contact: e_sano@d2.dion.ne.jp. ISBN: 978-4-9905010-0-6. 145 pp. Price: Japanese Yen 5,600. *Review in progress.*

Previously Listed Books

- **CBS Laboratory Manual Series 1: Fungal Biodiversity**, 2009. P.W. Crous, G.J.M. Verkley, J.Z. Groenewald, R.A. Samson (eds.). Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, <http://www.cbs.knaw.nl/publications/index.htm>. ISBN: 978-90-70351-77-9. 269 pp. Price: €50.00. *Reviewed in this issue.*
- **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: €94.00. *Reviewed in this issue.*
- **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. *Reviewed in this issue.*
- **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. *Reviewed in this issue.*
- **The Essentials of Clinical Mycology Study-NDMC. 2009 Edition**. Tien-ming Jen. National Defense Medical Center, Taipei. Price: Unknown. Contact: Tien-ming Jen jongtian@ms39.hinet.net. *Review needed.*
- **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. *Reviewed in Mar-Apr 2010.*
- **European species of Hypocrea Part 1. The green-spored species**, 2009. Walter M. Jaklitsch. Centraalbureau voor Schimmelcultures, P.O. Box 85167, Utrecht, The Netherlands, <http://www.cbs.knaw.nl/publications/index.htm>. Studies in Mycology 63: 1-93. Price: €90.00. *Reviewed in Mar-Apr 2010.*
- **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. *Reviewed in this issue.*
- **The Kingdom of Fungi. The Biology of Mushrooms, Molds, and Lichens**, 2010. Steven L. Stephenson. Timber Press, Portland, OR, www.timberpress.com. ISBN: 978-0-88192-891-4. 328 pp. Price: \$34.95. *Reviewed in this issue.*
- **Microbial Toxins: Current Research and Future Trends**, 2009. Thomas Profit (ed.) Caister Academic Press, Caister, Norfolk, UK, www.caister.com. ISBN 978-1-904455-44-8. 192 pp. Price: \$310.00. *Reviewed in Mar-Apr 2010.*
- **Microstructures of Vegetative Mycelium of Macromycetes in Pure Cultures**, 2009. Asya Buchalo, Oksana Mykchaylova, Margarita Lomberg, S.P. Wasser. Paul A Volz, Eviator Nevo (eds.). 120 pp. plus 100 pl. Price: Unknown. *Reviewed in this issue.*
- **Milk Mushrooms of North America. A Field Identification Guide to the Genus Lactarius**, 2009. Alan E. Bessette, David B. Harris, Arleen R. Bessette. Syracuse University Press, <http://www.syracuseuniversitypress.syr.edu/fall-2009/milk-mushrooms.html>. ISBN: 978-9-8156-3229-0. Price: \$110.00. *Review in progress.*
- **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. *Reviewed in Jan.-Feb. 2010.*
- **Plant Pathology. Concepts and Laboratory Exercises, Second Edition**, 2008. Robert N. Trigiano, Mark T. Windham, Alan S. Windham (eds.). CRC Press, Boca Raton, FL 33487, <http://www.crcpress.com>. ISBN 13:978-1-4200-4669-4. 558 pp. plus CD. Price: £42.99. *Reviewed in this issue.*
- **Revision of the corticolous Opegrapha species from the Palearctic**, 2009. Damien Ertz. Schweizerbart'sche Verlagsbuchhandlung, <http://www.schweizerbart.de>. ISBN 978-3-443-58081-0, Bibliotheca Lichenologica 102: 1–176. Price: €73. *Review in progress.*

TAKE A BREAK

Cookery Corner



Almond Mushroom Pâté

Ingredients:

2 tbs of margarine
1 small onion, chopped
1 clove garlic, minced
1 ½ cups of mushrooms, sliced
½ tsp of tarragon

1 cup of blanched whole almonds
1 tbs of lemon juice
2 tsp of soy sauce
dash of white pepper
2 tbs of cream cheese (optional)

Instructions:

Melt the margarine in a skillet.
Add the chopped onion, minced garlic and sliced mushrooms.
Sauté until tender but not browned.
Add the tarragon, then stir until it is softened.
Pour the mixture into a food processor.

Add the almonds, lemon juice, soy sauce and white pepper, then process until the mixture is smooth.

Add cream cheese for a more spreadable consistency.

Spoon the pâté into a serving bowl. Serve with crackers.

www.mushroomrecipes.us

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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.

June 28-July 1, 2010

MSA Meeting
University of Kentucky
Lexington, KY
www.ca.uky.edu/msaisfeg/

July 5-9, 2010

Introduction to Food and Air-Borne Molds
—a course in fungal identification
Ottawa, Canada
www.indoormold.org/Courses/ottawa.htm

July 26-August 7, 2010

Fleshy Fungi of the Highlands Plateau
Highlands Biological Station, NC
www.wcu.edu/hbs

August 1-6, 2010

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

August 2-13, 2010

Swimming mushrooms: fungi
in the marine environment
GCRL, Ocean Springs, MS
www.usm.edu/gcrl/summer_field/c_marinefungi.php

August 8-14, September 14-18, 2010

Mycology seminars at the Humboldt Institute
The Humboldt Institute, Steuben, ME
www.eaglehill.us/programs/nhs/nhs-calendar.shtml

November 29-December 2, 2010

VI Brazilian Mycological Congress
Brasília, Brazil

July 23-30, 2011

The International Botanical Congress
(IBC 2011)
Melbourne, Australia
<http://www.ibc2011.com>

2011 MSA Meeting

University of Alaska
Fairbanks, AK, USA

2011 UMS Congresses

XIII International Congress of Mycology
Sapporo, Japan

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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/

The Mycological Society of America Sustaining Members 2010

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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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