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Book reviews and notices

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Introduction

The books reviewed here are as diverse as the fungi themselves, with molecular systematics of *Penicillium* and a field guide to the species of one genus in one country for conservation purposes as extremes of one continuum. Several publications stand out because of the high quality photos.

Book announcements include a volume on smut fungi in the series Flora Fungorum Sinicorum, a Spanish guide, and a Festschrift for the lichenologist Thomas H. Nash III.

Ascomycetes

Phylogenetic and taxonomic studies on the genera *Penicillium* and *Talaromyces*. Edited by R.A. Samson and J. Houbraken. 2011. Studies in Mycology no. 70. CBS-KNAW Fungal Biodiversity Centre, P.O. Box 85176, 3508 AD Utrecht, The Netherlands. <info@cbs.knaw.nl>. Pp. 183, illustr. ISBN 978-90-70351-87-8. Price: 60 € (paper copy), download free.

This work is significant in two respects. First, with a publication date of 15 November 2011, it is the first major work on the taxonomy of *Trichocomaceae* to have appeared since the separate nomenclatural status of anamorph-typified and teleomorph-typified names of pleomorphic fungi ended on 30 July 2011. Second, it is a significant contribution to the phylogenetic systematics of *Penicillium* and *Talaromyces* in its own right, presenting the results of four fresh studies.

Of particular importance is Houbraken & Samson's overview and revised phylogenetic system for not only penicillioid but also aspergilloid fungi. This

* Books for consideration for coverage in this column should be mailed to the Book Review Editor at the address above. All unsigned entries are by the Book Review Editor.

may come as a shock to some — with even two new families being recognized. Molecular phylogenetic studies using several gene show that three families are warranted: (1) *Aspergillaceae* for *Aspergillus* s. str. (syn. *Eurotium*, *Fenellia*, *Neocarpentales*, *Neosartorya*, other teleomorphs, and *Stilbothamnium*), *Hamigera* (incl. *Merimbla*), *Leiothecium*, *Monascus* (incl. *Basipetospora*), *Penicilliopsis, Penicillium* s. str. (syn. *Chromocleista*, *Citromyces, Eladia*, *Eupenicillium*, *Hemicarpentales*, *Thysanophora*, and *Toluromyces*), *Phialomyces*, *Phialosimplex*, *Polypaecilum*, *Sclerocleista*, *Warcupiella* (incl. *Raperia*), and *Xeromyces*; (2) *Thermoascaceae* for *Paecilomyces* (incl. *Byssochlamys*), and *Thermoascus* (incl. *Coonemeria*, and *Dactylomyces*); and (3) *Trichocomaceae* for *Rasamsonia*, *Sagenomella*, *Talaromyces* (incl. *Erythrogymnotheca*, and *Sagenoma*), *Thermomyces*, *Trichocoma,* and tentatively for *Dendrosphaera*. Four genera remained unplaced: *Ascorhiza*, *Dichlaena*, *Pseudocordyceps*, and *Sarophorum*. While some might think the authors "jumped-the-gun," as the names *Aspergillus* and *Penicillium* are such widely used names compared with those of the teleomorph-typified generic synonyms, the wording of the Melbourne CODE can be taken as indicating they were not obliged to have this approved by the General Committee on Nomenclature established by the Congress. In any event, there are no nomenclatural penalties for their choices, which follow the rules applying to all non-pleomorphic fungi. Following this revision of the familial and generic concepts and names, more detailed accounts of the subgenera and sections of *Penicillium*, with detailed lists of the species to be included in them, are presented.

This overview is followed by a critical revision of *Penicillium* sect. *Citrina* by Houbraken, Frisvad & Samson, based on molecular phylogeny and physiology (especially extrolites produced). Thirty-nine species are accepted, of which 17 are described as new. Extrolite profiles and calmodulin and β-tubulin sequences can be used for species separations, but only about half of the species could be unambiguously identified by ITS sequences alone. Rivera & Seifert address the *P. sclerotiorum* complex with an equally critical and polyphasic approach, recognizing seven species, of which three are newly described; in this case ITS barcodes satisfactorily separated the taxa. The final contribution by Samson and seven colleagues addresses *Talaromyces* (incl. *P*. subgen. *Biverticillium*) and considers all taxa described in the group; 69 species are accepted, one newly described, many new combinations are made from *Penicillium* into the genus, and a list of excluded names and synonyms is provided. As expected with Jens Frisvad as one of the co-authors, detailed information is given on the extrolites, with the "exometabolites" tabulated in detail.

All four contributions are superbly illustrated with coloured photomicrographs of colonies as well as fine shots of conidiophores and conidiogenous cells. This is a carefully and well-produced work, which is a "must" for all workers

on penicillioid fungi and their allies, and is sure to attract many citations. My one regret is that no culture or morphology based keys are included. This means that it is becoming increasingly impossible to identify fungi in this group precisely without molecular sequence data for several genes.

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Basidiomycetes

Riisikad. The genus *Lactarius* in Estonia. By K. Kalamees, 2010. Natural History Museum, University of Tartu. Available from Katrin Kolnes (katrin.kolnes@ut.ee). ISBN 978-9985-4-0619-9. Pp. 187, many col. pl. Price 21 €

This modern treatment of the genus *Lactarius* in Estonia includes a short introduction to the taxonomic placement of the genus, list of species recorded for Estonia, an ecology chapter, illustrated overview of the main characters for identification, and a key to the species. The key, which is illustrated, is in both Estonian and English. The main part of the book is taken up by the 60 species descriptions, with short descriptions of another 22 that might exist in the country. A glossary, list of references, and species index conclude the book.

Each species is presented by a good colour photo (often several) to illustrate colour variation and development. There are no microscopic details depicted. The text accompanying the photos covers sequence data, herbarium data, and ample ecological details. Original data are used throughout. A short English characterization of each species is very helpful for non-Estonian speakers.

The number of species is smaller than that treated in the work by Heilmann-Clausen et al. (1998) for northern Europe. But the extra information, the high quality photos, and the low price make this a good choice. In short, a well executed, well researched and very valuable contribution to our knowledge of milk caps.

Heilmann-Clausen J, Verbeken A, Vesterholt J. 1998. The genus *Lactarius*. Fungi of Northern Europe Vol. 2.

Släktet *Hygrophorus*, Skogsvaxskivlingar i Sverige. En fältguide till SMF:s svampväkteri "Vaxvakt". By E. Larsson, S. Jacobsson & A. Stridvall, 2011. Mykologiska Publikationer 3. Sveriges Mykologiska Förening, Institutionen för växt- och miljövetenskpaer, Göteborgs Universitetet, Box 461, 40530 Göteborg, Sweden. <www.svampar.se> . 56 pp.

In 2011 the Swedish Mycological Society started a project to record and monitor *Hygrophorus* species throughout Sweden. With only 15 species common and

well known, many species are currently considered vulnerable or under threat and included on the red data list.

To help identify the focus species, a small booklet has been produced offering species keys with descriptions and colour photos of all 37 taxa that enable field identification. The emphasis is on macroscopic characters, with spore dimensions as the only microscopic characters presented. Notes on ecology and distribution are given for each species, showing that many species are host tree specific, and some notes on possible confusion with other species complete the species information. There is also a recording sheet for the 15 rare species for which material should be sampled and sent to Ellen Larsson, the first author. Though written in Swedish, the booklet is easy to understand with some help from modern translation web sites and knowledge of another Germanic or Scandinavian language.

General

Systematics and evolution of fungi. By J.K. Misra, J.P. Tewari & S.K. Deshmukh (eds), 2012 ('2011'). PROGRESS IN MYCOLOGICAL RESEARCH Vol. 2. CRC Press, Taylor & Francis Group, 6000 Broken Sound Parkway, NW, Suite 300, Boca Raton, FL 33487, U.S.A. <www.crcpress.com> ISBN 978-1-57808-723-5. Pp. 412, Pl. 2. Price US$119.95.

The second book in a series of four on 'Progress in Mycological Research' focuses on systematics and phylogenetics, and 13 individual chapters treat various fungal groups.

An introduction by Hawksworth in the first chapter presents the merits and problems surrounding sequence-based systematics. Chapter 2 is devoted to fossil fungi, *Chytridiomycota* are treated by Powell and Letcher (Chapter 3), and Benny gives an overview of the *Zygomycota*, their systematics, and possible segregation into four groups (Chapter 4). Lichtwardt (Chapter 5) presents the evolution of the *Trichomycetes*, followed by Misra (Chapter 6), who covers the systematics of the two largest genera of the *Harpellales* (*Stachylina* and *Smittium*) along with keys and species descriptions. Chapter 7 focuses on two genera of edible mushrooms, *Morchella* and *Macrolepiota,* in Israel, and Barseghyan et al. try to delineate species based on ITS and EF-1alpha sequence analyses but describe no new species. Chapter 8 highlights morphological characters that distinguish groups of mushroom forming fungi, and authors Zmitrovich & Wasser warn that groupings based solely on RNA genes should be considered with skepticism. Tura et al. (chapter 9) gives an overview of *Phellinus* s.l. and *Inonotus* s.l. in Israel based on ITS sequences and morphology. In Chapter 10 Uli-Mattila, who discusses toxigenic *Fusarium* species from small cereal

grains, advocates a combined approach using all available characters for species recognition, while Gannibal (Chapter 11) presents the consequences of phylogenetic studies of alternarioid hyphomycetes. Tewari et al. (Chapter 12) shift gears to note methods for rapidly diagnosing *Candida*-related human pathogens. In the last chapter, Nagy et al. provide an overview of various phylogenetic methods and models to unravel the evolution in fungi.

Many articles are reviews and literature compilations, but some new research is presented. In all it gives an idea of the state of knowledge of the groups covered here.

Regional Floras

Fungi of tropical China. By X.-L. Wu, Y.-C. Dai, T.-H. Li, Z-L. Yang & B. Song, 2011. Science Press, Beijing, <www.sciencep.com>. ISBN-13: 9787030294708. Pp. 548, col. plates 495. Price circa US$ 220 [480.00 Yuan]

It is a pleasure to leaf through this book full of good mushroom photos from tropical China. In total 495 species are depicted, out of the 2065 listed for the area in the back. The book, authored by five mycologists and written in Chinese with Latin nomenclature and English chapter headings, gives an overview of the habitats (with their fungi), a checklist of all tropical fungi in China, and an extensive reference list; the main part of the book is devoted to species photos and descriptions. On the right hand page are two or three photos opposite the description on the even numbered pages. The majority of the taxa belong to the basidiomycetes. The species are ordered according to their phylogenetic position, for instance *Auriscalpium* can be found near the genus *Russula*. It is really nice to see so many ectomycorrhizal species depicted; *Amanita,* for instance, is well represented by 37 species and at least 35 species of boletes are included. Among the wood inhabiting fungi, *Ganoderma* stands out with 30 species, while stinkhorns in all their weird beautiful shapes and colours are represented by 21 species.

It is obvious that in some groups, names from species described from other regions have been applied to southeastern Asian specimens and are not always correct. Two such misapplied names are '*Lactarius deliciosus*' and '*Anthurus archeri,*' and the photo of *Suillus bovinus* does not look typical for that species.

Most species have been photographed in the field, but lab photos have been used for a very small number.

The book shows the diversity and richness of fungi in tropical China, and can certainly be used outside China. I encountered many taxa that are familiar from northern Thailand. I am looking forward to seeing an English translation of this book to make it more accessible to the rest of the world.

Mycota of Rhode Island: A checklist of the fungi recorded in Rhode Island (including lichens and myxomycetes). By R.D. Goos, 2010. THE BIOTA OF RHODE ISLAND vol. 4. Rhode Island Natural History Survey, P.O. Box 1858, Kingston, RI 02881, <programadmin@rinhs.org>. ISBN 1-887771-09-3. Pp. 228. Price US$60.00

Strangely enough, there do not seem to be many checklists of fungi for the U.S.A., either for separate states or as a whole. I tried to find such lists on line but was only able to find the database for plant pathogenic fungi at the U.S. National Fungus Collections. For European countries, checklists of macrofungi are seen as a prerequisite for recording and mapping programs, on which conservation efforts and red data lists can be based.

The present list for the state of Rhode Island, the smallest of the 50 states (comparable in size to the Cape Verde Islands), encompasses all fungi, from *Chytridiomycota* and *Glomeromycota* to *Basidiomycota;* slime molds and *Oomycota* are also covered. The list is restricted almost exclusively to verified records and based on a number of different sources (herbaria, literature). The presence of voucher specimens is a must.

A short history of the mycology practiced in the state forms the prelude to the main part of the book with the species lists. For each species the following information is given: full name including authority, host and substrate, an indication of distribution and rarity, and references and or herbarium records. The book is illustrated with nice line drawings by Roberta Calore.

It is great to have this information available, but of course this is the kind of data that should be available for all, and searchable in various ways on line.

BOOK ANNOUNCEMENTS

Biomonitoring, Ecology and Systematics of Lichens. Recognizing the Lichenological Legacy of Thomas H. Nash III on his 65th Birthday. By S.T. Bates, F. Bungartz, R. Lücking, M.A. Herrera-Campos & A. Zambrano (eds), 2011. BIBLIOTHECA LICHENOLOGICA Band 106. ISBN 978-3-443-58085-8. Pp. 442, col. pl. 16, figs 102. Price 109 €

Flora Fungorum Sinicorum Volume 39. *Tilletiales Urocystidales Entorrhizales Doassansiales Entylomatales Georgefischeriales*. By G. Lin, 2011. ISBN 9787030314536 Pp. 152 p., figs. Price around US$ 49.00.

Guía de hongos de la península ibérica. By G. Moreno & J.L. Manjón, 2011. Ediciones Omega, S.A. Calle Plató, 2608006 Barcelona, Spain. <www.ediciones-omega.es>. ISBN 978-84-282-1349-3. Pp. 1440, 590 col. pl. Price 100 €