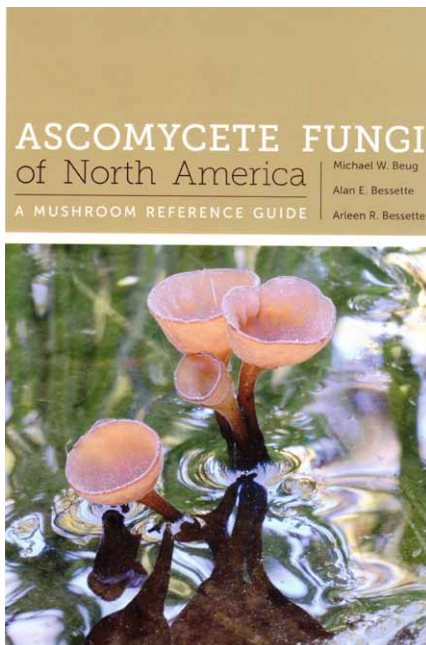


**Ascomycete Fungi of North America: a mushroom reference guide.** By Michael W. Beug, Alan E. Bessette, and Arleen R. Bessette. 2014. Austin: University of Texas Press. Pp. xii + 486, illustr. colour. ISBN 978-0-292-75452-2. Price: US\$ 85.



Just one year after the appearance of *Ascomycetes in Colour* (Thompson 2013; see *IMA Fungus* 4(1): (25), June 2013), devoted to the UK, it is a pleasure to welcome another beautifully illustrated work on the phylum. The treatment of the tens of thousands of ascomycete species that must occur in North America in a single printed work would clearly be impractical, and here the authors. "... have focussed on those species found in the continental United States and Canada that are large enough to be readily noticeable to naturalists, photographers, and mushroom hunters, and those that reproduce sexually. . ." (p. ix). Around 600 species are featured with macro-photographs that can only be described as stunning, with their own supplemented by ones which have been painstakingly sourced from a long list of contributors.

Following a brief introduction to the phylum with photographs of some microscopic features, is a "picture key" to the included ascomycetes where at the end of the last couplet reduced-size photographs are presented with cross-references to the pages on which they are mentioned; "mentioned" as some are different from those treated in detail in the main entries to help deal with the issue of "look-alikes", and their known

distributions are indicated by abbreviations for particular states or more general regions. The detailed treatments are organized into ten chapters. The first, on hypogeous taxa, is particularly comprehensive and is the only one to include a traditional dichotomous key to the treated genera. *Pezizomycetes* and *Leotiomyces* are by far the largest chapters, between them occupying about half the book. Surprisingly, *Neoelectomyces* (with just two species in North America) has two pages, while what is probably the largest class of ascomycetes in the region, *Dothideomycetes* has just four. The *Lecanoromycetes*, sadly, do not appear at all even to introduce them in the way adopted for *Dothideomycetes*.

The photographs of the individual species are almost all macroscopic, with microscopic features confined to short descriptions. In general the photographs are first-rate, but it would have been good to have closer shots of, for example, fungicolous species such as those of *Hypomyces* where infected basidiomes are figured but the features of the intended fungi are not or scarcely visible. Thumbnail size drawings of spores, such as those in Thompson (2013), would have been a valuable addition, though I would have preferred to see fuller sketches such as those used in Breitenbach & Kränzlin (1984) emulated. The end of dual nomenclature for pleomorphic fungi that became operational in July 2011 is noted, but sadly the idea is perpetuated here by the citation of separate names of anamorphs below the accepted names in the same-sized type; those names should have just been prefixed by "Synonym:" not "Anamorph"! Author citations are given, but with no reference or dates, and surprisingly are also given in full rather being abbreviated as is the commended practice; further, there are errors and inconsistencies in these; "Schroeter" and "Schröter" even appearing on adjacent lines (p. 301). The ": Fries" citations, to indicate sanctioned names, is used in some cases it applies, but omitted in others; there is even a "Persoon : Mérat" (p. 351) indicating a lack of understanding of sanctioning – still a too frequent occurrence even though it is 33 years after the notation

was introduced. Further, author citations are also given in full when species are mentioned in the notes, wasting space for no added information. They are best omitted in all but formal taxonomic and nomenclatural treatments; these have not been treated as an integral part of scientific names under the *Code* since 1999. Today, full citations of authors and bibliographic details for all scientific names are easily obtained free of charge through the *Index Fungorum* or MycoBank websites if required; they are not essential in works primarily directed at citizen scientists and naturalists.

The Comments sections of each entry are packed with information including discussions of separations from other species, treated and untreated. Synonyms are often also mentioned here, and in some cases references to key publications are included. No nomenclatural novelties are formally introduced here, but there is an English description of an as-yet undescribed *Xylaria* species, *X. atropictor*, from the Pacific Northwest (p. 348); it is to be hoped that that name will be validated before too long. The book concludes with an extensive glossary, 12 pages of references, photo credits, indices to both common and scientific names.

Notwithstanding the above remarks, this is a much-needed and super book which should do much to stimulate interest in North American ascomycetes, especially those most likely to be noted in the field by non-specialists. The authors, all extremely experienced field mycologists, but not professionally employed as mycologists, are to be congratulated on producing a visually striking major contribution to our knowledge of North American ascomycetes. In common with *Lichens of North America* (Brodo *et al.* 2001), it contributes to filling a gap that exists in the absence of comprehensive authoritative treatments of so many groups of North American ascomycetes. Updates of Ellis & Everhart (1892) and Seaver (1942, 1951), in particular, remain sorely needed . . .

Breitenbach J, Kränzlin F (1984) *Fungi of Switzerland*. Vol. 1. *Ascomycetes*. Lucerne: Verlag Mykologia.

Brodo IM, Sharnoff SD, Sharnoff S (2001) *Lichens of North America*. New Haven: Yale University Press.

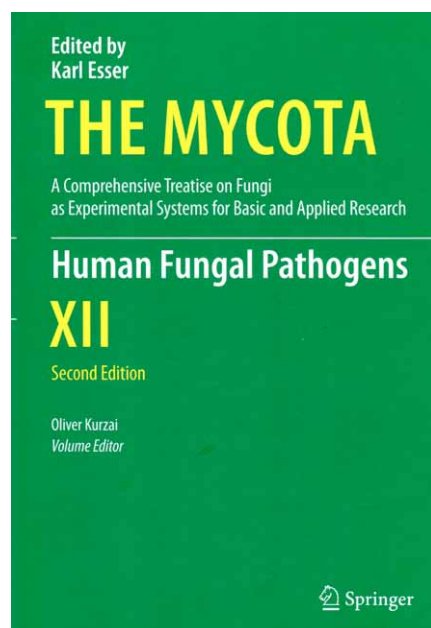
Ellis JB, Everhart BM (1892) *North American Pyrenomyces*. Newfield, NJ: Ellis & Everhart.

Seaver FJ (1942) *The North American Cup-fungi (Operculates)*. Suppl. Edn. New York: Seaver.

Seaver FJ (1951) *The North American Cup-fungi (Inoperculates)*. New York: Seaver.

Thompson PI (2013) *Ascomycetes in Colour, found and photographed in mainland Britain*. Dartford: Xlibris Publishing.

**Human Fungal Pathogens. Edited by Oliver Kurzai. 2014. Heidelberg: Springer. [The Mycota Vol. 12, 2<sup>nd</sup> edn.] Pp. xxii + 298, illustr. ISBN 978-3-642-39431-7 (hdbk), 978-3-642-394234-4 (eBk). Price: £ 180 (hdbk), £ 144/ US\$ 209/ 166.59 € (e-bk).**



The original edition of this volume, edited by Judith E. Dömer and George S. Kobayashi, appeared in 2004. This new edition has no authors in common with the first edition, and in his Preface the editor, who trained as a medical doctor, explains that his fascination for fungal pathogens was stimulated by Frank Odds' *Candida and Candidosis* (Odds 1988) and he wished

to produce an equally useful book. He saw the first edition as a "collection of nuggets" rather than an "overview . . . of medical mycology", a sentiment with which I concur. The new edition has a much more hands-on flavour. The 15 chapters are organized into four sections reflecting this thrust: Basis of Fungal Virulence; Immune Responses to Fungal Infections; Clinical Presentations and Epidemiology of Fungal Infections; and Treatment of Fungal Infections.

The focus is on the fungal pathogens of major medical concern in the developed world, with less attention paid to those of tropical regions. Chapters that concern aspects of the mycopathology of particular genera include ones on *Aspergillus* (2 chapters), *Candida* (2), *Cryptococcus* (1), *Histoplasma* (1), *Mucorales* (1), and *Pneumocystis* (1). The other chapters are much more overviews, addressing topics including the prediction of fungal virulence, T-cell responses, visualizing immune responses, diagnostics, therapeutic strategies, and antifungal pharmacokinetics. It is always invidious to single out particular contributions in multi-authored works, but three I found particularly informative here were those on *Aspergillus fumigatus* by Elaine Bignall, infections by *Mucorales* (by Malcolm

D. Richardson), and diagnostics (by Birgit Willinger, Daniel Kienzl, and Oliver A. Cornely). The last is refreshingly practical ranging from histopathology, radiology, and the use of antigens, to the latest molecular tools.

The Editor is to be congratulated on largely achieving his aim of producing an inspiring work for the fungi of major medical concern, but dermatophytes and other opportunistic fungi do not feature as strongly as might be expected in such a title. This is perhaps a consequence of other fungal-human relationships being treated in a different volume of the series (Howard & Miller 1996). While not in itself a new vademecum of the whole field of medical mycology, this volume does approach that for the major human pathogens and should be accessible to both practising consultants and pathologists, as well as to researchers and those studying medical microbiology.

Howard DH, Miller JD (eds) (1996) *Human and Animal Relationships*. [The Mycota vol. 6.] Heidelberg: Springer.

Odds FC (1988) *Candida and Candidosis*. 2<sup>nd</sup> edn. London: Bailliere Tindall.

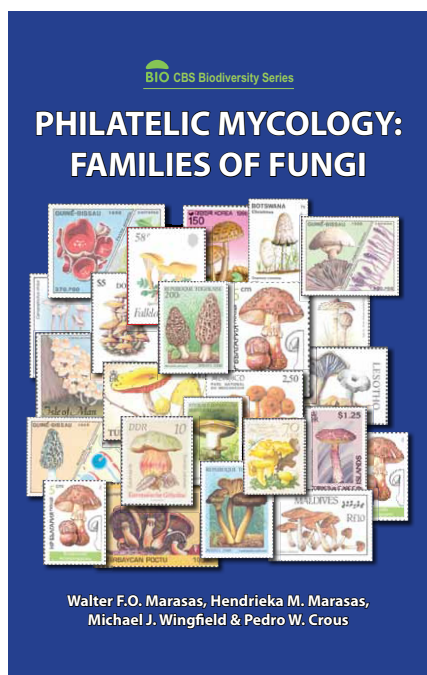
**Philatelic Mycology: families of fungi. By Walter F. O. Marasas, Hendrieka M. Marasas, Michael J. Wingfield, and Pedro W. Crous. 2014. Utrecht: CBS-KNAW Fungal Biodiversity Centre. [CBS Biodiversity Series no. 14.] Pp. viii + 107, illustr. ISBN 978-90-70351-99-1. Price: 40 €.**

Following his retirement in 2007, leading South African mycotoxicologist and *Fusarium* specialist "Wally" Marasas Wally devoted himself to organizing 1000 of his fungal stamps for publication as a book. Unfortunately he did not live to see this dream realized before he died in 2012 (see Wingfield & Crous, *IMA Fungus* 3(1): 27–28, 2012). Wally left his collections of stamps of fungi, and also, plants to Michael

"Mike" Wingfield, who he had mentored in his student days, along with the associated texts he had been working on for the fungal book. Now, painstaking work by Mike, Pedro Crous (another former student), and also Wally's widow "Rika" have now made his vision a reality.

The first stamp depicting a fungus was issued by Romania in 1958, and depicted *Macrolepiota procera*. Many other postal

services followed, and by 1990 the number had rocketed to almost 800 in 143 editions -- of which a complete set compiled by German mycologist H. Peter Molitoris was one of the highlights of the exhibitions at IMC4 in Regensburg in 1990; a detailed catalogue was published for the Congress (Molitoris 1990). Peter's collection exceeded by 150 the 650 listed in a reference catalogue of fungal stamps published the



following year (Greenwich 1991). Swiss mycologist Doris Rast presented the British Mycological Society with her collection in 1991, which amounted to 837 items from 103 countries, including first-day covers so treasured by philatelists and also thematic postcards (Moss 1993). Six years

later, the total had jumped to 1400, with examples from 140 countries showing 575 species (McKenzie 1997). These totals are all of stamps depicting the fungi, excluding ones illustrating diseases they cause, fungal products (e.g. antibiotics, alcohol products), or commemorating individuals. If those latter categories are not excluded, the total is currently estimated at around 5000 by David Moore, who maintains a website on fungal stamps (<http://www.davidmoore.org.uk/Fungi-on-Stamps00.htm>).

Of the huge number of fungal stamps now available, Wally selected just 1000 for this book. These are arranged not by country and editions, as is the case in the other compilations mentioned here, but systematically by phylum, class, order, family, and genus. The selection is necessarily eclectic, and appears to have been based on fungi that interested him, or on which he had fascinating tid-bits to add. Macromycetes predominate, and there are many examples of some species, for example 25 of *Amanita muscaria*, 25 of *Boletus edulis*, and 23 of *Cantharellus cibarius*. The notes comment on classifications, etymology, common names, edibility, toxicity, and characteristic features of the fungi making it

a pleasure to have on a coffee table and dip into. Searching for particular genera would, however, have been facilitated by an index to genera featured.

Most spectacularly, however, all 1000 stamps are illustrated in colour from digitized images arranged on a black full-page background. The layout is a great tribute to the skill and dedication of Rob Samson, Marjan Vermaas and Manon Verweij at CBS and renders the whole most attractive. This “work of love and passion by [a] great mycologist, [and] wonderful man” (p. iv) is sure to be much appreciated by both stamp-collecting mycologists and other philatelists.

Greenwich J-P (1991) *Collect Fungi on Stamps*.

[A Stanley Gibbons Thematic Catalogue.]

London: Stanley Gibbons Publications.

McKenzie EHC (1997) *Collect Fungi on Stamps*. [A

Stanley Gibbons Thematic Catalogue.] 2<sup>nd</sup> edn.

London: Stanley Gibbons Publications.

Molitoris HP (1990) *Fungi on Stamps*. [IMC4

Exhibition EH-4.] Regensburg: University of Regensburg Library.

Moss MO (1993) The Doris Rast fungal stamp

collection. *Mycologist* 7: 28.

## Poroid Fungi of Europe. By Leif Ryvarden and Ireneia Melo. 2014. Pp. 455, 344 figs (210 in colour). Oslo: Fungiflora. [Synopsis Fungorum no. 31.] ISBN 978-82-90724-46-2. Price: £ 94.99.

This work is introduced as a “natural follow-up” to *European Polypores* (Ryvarden & Gilbertson 1993-4). Leif Ryvarden has unparalleled experience of polypores worldwide, and here he is joined by Portuguese mycologist Ireneia Melo. Many photographs and drawings were contributed by other specialists, including Tuomo Niemelä who is particularly renowned for his superb photography (e.g. Niemelä & Meike 1999). The overall classification of the polypores has undergone a revolution since the 1990s, as molecular studies revealed that the long-established *Polyporaceae* was polyphyletic, and that some basidiomycete families included both pored and gilled species. Pragmatically, as the aim of the book is to provide an identification manual, a traditional interpretation is prudently adopted. Molecular studies have also revealed that some genera required re-modelling, but in many cases broad circumscriptions have been retained. This has been a deliberate policy, and “for those that prefer smaller and monophyletic

genera” a list of 39 generic names not used, but the type species of which occurs in Europe, is provided. The authors consider that “systematics is a subjective science and that there will probably never be a consensus on just how different two taxa have to be before they are called a species . . .”; this statement reflects an aphorism with which I concur. Fortunately, although generic placements have changed over recent decades, the species epithets in these fungi has remained relatively stable, particularly since the meticulous work of Donk (1974); an index arranged by species epithets facilitates the accessing of the correct page(s) if the generic placement is unknown.

The book starts with succinct overviews of diverse aspects of these fungi, from characters used in identification (including hyphal types) to roles in wood decay and as pathogens, biogeography, and practical tips for collection and examination. Following a traditional artificial key to genera, I was pleased to see also a synoptic key. Treatments of the individual genera

### Poroid fungi of Europe

L. Ryvarden & I. Melo

With photos by T. Niemelä and  
drawings by I. Melo & T. Niemelä



Synopsis Fungorum 31  
Fungiflora

are wisely presented alphabetically rather than by family which is boon to anyone wanting to locate a particular genus quickly. The generic entries include synonyms, an



indication of the type, remarks, and, where more than a single species in a genus is treated, a dichotomous (and in some cases also a synoptic) key is provided. The species entries have detailed descriptions, selected synonyms, and notes on distribution. Line drawings of microscopic features and a colour photograph of the basidiome of at least one species of the genus are generally included. Places of publication of the scientific names are provided, but it is unfortunate that in some instances places of sanctioning are cited rather than the actual original places of publication; for example, *Boletus biennis* Bull., *Herb. Fr.* 10: tab. 449 (1789) is the basionym of *Abortiporus biennis* (Bull. : Fr.) Singer 1944, and not "*Daedalea biennis* Bull.: Fr., *Syst. Mycol.* 1: 332, 1821". This is an issue that sadly continues to confuse even experienced mycologists, even though it is now 33 years since the rules were changed. Notwithstanding the policy of

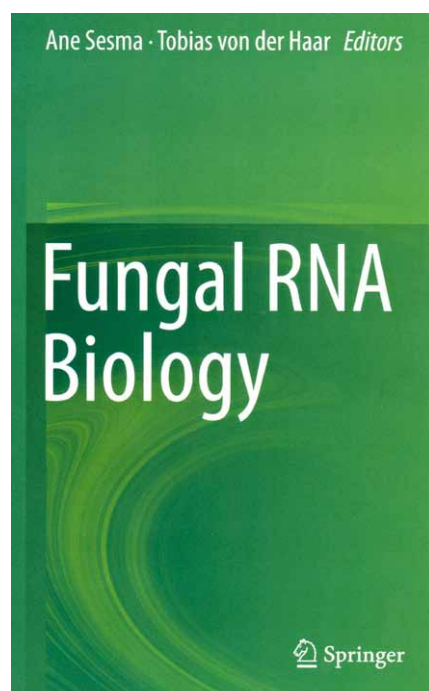
avoiding name changes, however, five new combinations are made, one each into the genera *Antrodia*, *Antrodiella*, *Hapalopilus*, *Oligoporus*, and *Oxyporus*.

It is inevitable that this book will be compared with that of Bernicchia (2005). He treated 292 species, compared with the 394 accepted here – a difference largely explained by the increased coverage of Fennoscandian and Russian species in the new work. Bernicchia does, however, score on colour photographs, with 343 compared with 210 here; each species has at least one and he also provided photographs of microscopic features of all 292 species. The two works consequently complement each other to a considerable degree. This new A4 size book is attractively laid out, and well-produced, and, of course there are the occasional slips which inevitably escape the proof-readers' eye and which it would be invidious to single-out here as they do not detract from its value. This is

a "must-have" for all who strive to identify polypores, as professional mycologists, forest pathologists, and citizen scientists. As many of the species are not by any means confined to Europe, it will assist those also working with these fungi elsewhere in the Northern Hemisphere forests. The authors and their collaborators are to be congratulated on having produced such a superb and authoritative work.

- Bernicchia A-R (2005) *Polyporaceae s. l.* [Fungi Europei no. 10.] Alassio: Candusso Edizioni.
- Donk MA (1974) Check list of European polypores. *Verhandlungen der Koninklijke Nederlandse Akademie van Wetenschappen, Afd. Natuurkunde, ser. 3* 62: 1–469.
- Niemelä T, Meike J (1999) *CD-Kääpäopas. CD Guide to the Polypores of Finland.* Helsinki: Finnish Museum of Natural History.
- Ryvarden L, Gilbertson RL (1993–4) *European Polypores.* 2 vols. [Synopsis Fungorum nos. 6–7.] Oslo: Fungiflora.

**Fungal RNA Biology. Edited by Ane Sesma and Tobias von der Haar. 2014. Cham, Switzerland: Springer. Pp. ix + 395, illustr. (some in colour). ISBN 978-3-319-05686-9 (hdbk), 978-3-319-05687-6 (e-bk). Price: £ 135 (hdbk), £ 108 (e-bk).**



DNA, nuclear and mitochondrial, preoccupies molecular phylogeneticists, but it is gene expression and RNA-mediated processes which are crucial for the understanding of how fungal cells operate. While these systems are generally investigated in a limited number of "model" fungi, both yeasts and filamentous fungi,

they are so fundamental to the fungal life-style that the processes elucidated are likely to be widely applicable in the kingdom. The editors also point out in their Preface, that, because of the relatively modest size of fungal genomes, studies on fungi can contribute to a deeper understanding of mechanisms of RNA-dependent processes in eukaryotes generally. Many of such processes in fungi appear identical to those in other eukaryotes, but some do not and appear peculiar to the kingdom.

In this volume, the editors have brought together contributions from a broad spectrum of research groups with the aim of providing "a valuable resource for students and researchers studying RNA-dependent processes" (p. vi). The 15 chapters demonstrate the incredible detail now revealed about how fungal cells operate, and the amazing and accelerating progress in the last 10 years. While much of this may be familiar to those actively working on these processes, for the non-specialist it provides glimpses into what is now a huge and expanding body of research. The first eight of the 15 chapters that make up the book consider diverse aspects of messenger RNA (mRNA). Amongst the topics covered are the polymerase II transcription in

*Saccharomyces cerevisiae* using chromatin rather than naked DNA as a template, and the interplay between synthesis and degradation that results in a buffering system for mRNA concentration. A "splicing" system exists to remove introns from pre-mRNA, so that the coding exon regions are joined without interruption; several splicing factors can be combined into structurally complex, and by molecular standards massive, spliceosomes. The mRNA has a polyadenosine tail at one end which is not encoded for, but added chemically after transcription. Thus a single gene can produce multiple mRNA isoforms (APA isoforms) which can regulate the response to DNA damage. The transcription, processing and export of mRNA are highly conserved mechanisms in eukaryotes, and best-studied in *S. cerevisiae*. mRNA localization is linked to cell polarity and asymmetry, so there is much information here on our current understanding of those fundamental systems. Also addressed is mRNA degradation and decay processes, as rapid turnover is essential for quick responses as the transcriptome composition changes, and any faulty mRNAs needs to be excluded; the surveillance pathways for the latter, nonsense-mediated decay (NMD), nonstop

decay (NSD) and no-go decay (NGD), have a whole chapter!

The remaining chapters address a diverse range of topics. The complex issue of ribosome assembly, including the crystal structure of the subunits and detailing the huge number of genes involved in SSU LSU assembly in *S. cerevisiae* and their notations in four other fungi. Transfer RNAs (tRNAs) can be modified after transcription, to either maintain the general shape of the molecule or improve its interactions with partner molecules. RNA-mediated silencing is described in *Neurospora*, which can be by “quelling” or meiotic silencing of unpaired DNA. Some endogenous small RNAs, from studies on *Mucor circinelloides*, have the

ability to suppress gene expression through RNA interference pathways, and so regulate gene expression and control different cellular functions. The last chapter in this group on special aspects addresses the involvement on non-coding RNA in the organization and regulation of pericentric heterochromatin in *Schizosaccharomyces pombe*. The book concludes with two more wide-ranging chapters reviewing methods of analysis. The first on approaches to ascertaining the functions of RNA-binding protein networks, and the other on the wide range of bioinformatic tools now available for next-generation RNA sequencing analysis.

A particular welcome feature is the provision of numerous coloured

diagrammatic figures illustrating modes of action, pathways, and structures; some of these will be of particular value in teaching. Further, almost all chapters end with several pages of references. The editors are to be congratulated on producing a scholarly and in-depth review, which will be a boon to not only fungal cell biologists, but those concerned with the molecular biology of eukaryotes generally. Using selected yeasts and filamentous fungi as model organisms has clearly already facilitated leaps in understanding the RNA-systems to a remarkable extent – and from this book they seem set to continue to do so.