Book Reviews

Kiffer, E. & M. Morelet (2000). The deuteromycetes: mitosporic fungi, classification and generic keys. – Science Publishers, Inc., Enfield, NH 03748, USA. ISBN 1-57808-068-1; 273pp.

Three years after the publication of the French edition, an English translation of "The deuteromycetes: mitosporic fungi, classification and generic keys" by Kiffer & Morelet has been prepared. The text was updated by the authors in 1999 according to the most recent data. Thirty eight pages of introduction outline the complexity of the deuteromycetes as an artificial group. Much emphasis is given to the life cycles with respect to the whole fungus. Step by step the artificial classification system is introduced down to the generic level, presenting the Saccardoan and Grove's system on spore pigmentation as well as the classification adopted by Hughes (1953). The terminology used to describe mitosporic fungi is carefully explained and illustrated, and information obtained by electron microscopy has also been incorporated. In 12 sections organised basically in the same way the various form groups of deuteromycetes are described and outlined, following Hughes (1953) and the authors' own concepts. Conidiogenesis and conidial morphology are explained in detail, supported by schematic line drawings by E. Kiffer and transmission electron microscopy photographs reprinted from the literature. References allow the reader to track down the "history" and recognition of the various groups of mitosporic fungi. A key is given and comprehensive tables listing geographical distribution, mode of life, substrates and impact, anamorph-teleomorph connections, additional references, and a short comment on the availability of molecular data for the genera belonging to a form group are provided. Schematic line drawings of the genera, with good links to the table and the key complete the information. In addition, variations of conidiogenesis occurring within the main groups are discussed, thus making the volume very complete but also very complex. Specific examples of the conidiogenesis are discussed. Bibliography, glossary and an index to fungal taxa close the book.

This volume tries and summarises the wealth of information on deuteromycetes scattered in the literature over time, refined by the authors' own conclusions and interpretations of the various kinds of conidiogenesis. It is a clear advantage to find such an overview of the various morphological groups, traditionally separated in several books according to the mycologists' specialisation and preferences. A disadvantage, especially for novices, however, lies in the complexity of the information presented and in its organisation. The successful use of this book and its keys requires a thorough understanding of the introduction, which means careful reading, working through the text and memorising its content. This is by no means an easy job, in particular for beginners. At the end of the introduction schematic drawings of the various types of conidiogenesis allow the readers to pick out the key for a specific group. A table on the opposite page refers to the appropriate section number to be consulted, however, without reference to page numbers.

The arrangement of the sections' subdivisions such as text part, key, tables/ illustrations is variable. Sometimes the text flows below the tables. The keys are

often interrupted by block of tables and illustrations. For example, before the last page of the key to the genera of Aleurosporae and Monoblastosporae 12 pages of tables and illustrations are inserted, in the case of the key to Phialosporae even 31 pages. At least, however, the tables are always on the opposite page of the corresponding illustrations. There are also some extremely long dichotomous keys, e. g. for the phialosporae, where 302 couplets are needed to identify *Nattrassia*, 365 to key out *Trematophoma*. Despite its subdivision by groups such as hyaline ameroconidia, hyaline septate conidia, with coremia, pycnidia etc., for shortcuts, the numeration of the couplets is continuous. The authors were well aware of such practical problems, as in the first pages they provide some advice on how to use this book according to the degree of the user's knowledge.

A general bibliography divided according to taxonomic and ecological fungal groups at the end of the introduction informs about the basic books and series containing more information on the various genera. This is essential, as many genera treated are not referenced, e. g. *Wardomyces*, *Nigrospora* (Table IVA). This is a serious shortcoming, however, as I do not know how a beginner could imagine to look in Ellis (1971) for more details such as conidial size. It is a pity that the additional references in most cases do not give the names of authors. For instance, it would be difficult to find the correct reference for *Aureobasidium* in the bibliography at the end of the book, to search for it in a reprint collection or to order the literature in a library. In my opinion, the authors should have given more attention to linking genera to references for morphological details other than conidiogenesis and conidial morphology (e. g. conidial size).

My criticisms, however, should not obscure the strength of this publication. The book plays a pivotal role in explaining conidiogenesis in all its aspects, it summarises previous literature and is a very useful addition to existing identification books in this subject.

I hope that the English version will find an adequate distribution, as the French original almost went unnoticed among the non French speaking mycologists.

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References

Ellis, M. B. (1971). Dematiaceous hyphomycetes. – C. M. I., Kew, 608 pp.
Hughes, S. J. (1953). Conidiophores, conidia and classification. – Can. J. Bot. 31: 577–659.

Noyd, Robert, K. (2000). Mycology Reference Cards. – APS Press, St. Paul, Minnesota 55121-2097, USA; ISBN 0-89054-261-9. $8\,^1/_2'' \times 11''$; laminated: 3-hole punched; 8 cards, 121 illustrations, US$ 29. –, excluding postage and handling.

Key features of the 10 most important fungal phyla are described in these 8 laminated, three–hole punched cards in US-letter format. The first card is dedicated to the fungal phylogeny and the fungal holomorph concept and the others illustrate the classification scheme of Ascomycota, Basidiomycota, Deuteromycota, Zygomycota, Chytridiomycota, and the four phyla of slime molds. Each classification map provides an overall hierarchical structure of the phlyum to the ordinal and in some cases to the family level. A glossary is available on the back of each card, with the most relevant terms used on the corresponding card.

The information given is not new, as it is based mainly on textbook information (e. g. Alexopoulos & al. 1996; "Anateleo Query" web site, University of Alberta, Canada). There are very few original drawings, most of the illustrations were reprinted or re-drawn (with permission) from other books. New, in any case, is the presentation of the various fungal characteristics for each phylum. The schematic display of the hierarchy within the single phylum combined with key words of morphological characters and names of representative genera allow the readers, especially beginners, to obtain a quick overview of the fungal classification which is sometimes difficult to find in the text books. Having said this, it is clear that the target group for these reference cards are students of introductory mycology courses and teachers at this level.

The presentation of fungal families and orders for teaching is always problematic, as different schools may have a slightly different way of looking at taxonomy. Therefore, an indication of the concept followed by the author would have been essential, as the classification presented on the cards differs in some aspects from that applied in the dictionary of fungi (Hawksworth & al., 1995) or that presented by Eriksson & Winka (1997). For instance, the order of the Heliotiales is still used, while more modern concepts reference the Leotiales instead. As another example, the Myriangiales and Pleosporales are treated here separately, whilst they are included in the Dothideales according to the "Dictionary" and Eriksson & Winka (1997). The Boletales are incorporated in the Agaricales and the Pythiales are included in the Peronosporales, which contrast to the classification given by the "Dictionary".

In the authors' concept, the characters presented should allow the reader to differentiate easily the orders treated. The presentation, however, is not always consistent. For example, the ascocarp size is given for the Eurotiales, but not for the Onygenales, whilst the ascospores are described in the Onygenales but not in the Eurotiales. The stromata, an important feature of the Xylariales, are not mentioned and the authors have overlooked the fact that not all Xylariales are only saprobes.

The term Deuteromycota as a form order is still used and a card is devoted to this group – it is amazing, however, that only anamorphic forms of the Ascomycota are explicitly mentioned here. The card points out their artificial nature, but there is no clear link to the term mitosporic fungi as explained in the fungal holomorph concept (Card "Fungal phylogeny"). This card correctly omits the deuteromycota, but the authors do not mention any anamorphic forms for the Ascomycota and the Basidiomycota. In general, I would have preferred to see more emphasis put on the term mitosporic fungi and anamorphs and their relationship to the teleomorphs, as these are important characters of the fungal phyla.

The glossaries seem to be quite complete. As they always refer to the terms used overleaf, there is some redundancy and the same terms may be explained in different cards. I am not very happy about some definitions, which are in some cases hard to be understood. For instance, the different types of conidiogenesis, quite complicated, are not explained very exhaustively. I wonder, in fact, how a beginner will understand the explanation of the thallic ontogeny ("conidiogenesis whereby a conidium enlarges after it is walled off").

These cards are an interesting approach to visualise the kingdom of fungi. As such, they may help to get a very basic idea of fungal taxonomy. While the idea is interesting, they fall quite short from achieving their goal, as they need refining and to be more accurate.

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Alexopoulos C. J., C. W. Mims & M. Blackwell (1996) Introductory Mycology, 4th ed. – John Wiley & Sons.

Eriksson, O. E. & K. Winka (1997). Supraordinal taxa of Ascomycota. – Myconet 1: 1–16.

Hawksworth, D. L., P. M. Kirk, B. C. Sutton & D. N. Pegler (1995). Ainsworth & Bisby's Dictionary of the fungi 8th ed. – CAB International, 616pp.

Seifert, K. A, Gams, W., Crous, P. W. & Samuels, G. J. (2000). Molecules, morphology and classification: Towards monophyletic genera in the Ascomycetes. – Studies in Mycology 45: 1–230. ISBN 90-70351-41-2. Price: NLG 100. – excluding posting and handling.

This volume of "Studies in Mycology" includes 17 papers (with an introduction and an afterword) that are based on contributions to two different international symposia held in 1999 (one at the International Botanical Congress in St. Louis and the other at the International Congress of Mycology of the International Union of Microbiological Sciences in Sidney). Both symposia were mainly devoted to current trends in the generic classification of anamorphs and teleomorphs in the Ascomycetes and tried to integrate molecular information and morphology. By focussing on a small number of Ascomycete orders that are particularly rich of anamorphs, the 'genus for genus' concept and ideas about an unfolding integrated classification system of anamorphic and teleomorphic genera were addressed.

The first contribution (by Seifert and Samuels) presents an overview of the role that anamorphs had for taxonomy in the past and how molecular techniques, particularly the automated DNA sequencing, and the application of cladistic taxonomy has revolutionized the way taxonomy is done today. According to such modern studies the teleomorphic or the anamorphic phenotype may no longer be the final arbiter of phylogenetic relationship in all cases. Also, anamorphs (or synanamorphs) of distantly related taxa may not necessarily be homologous, which will pose a serious problem in an integrated classification system.

In the second paper (by P. F. Cannon and P. M. Kirk), the philosophy and practicability of unified anamorph and teleomorph concepts are discussed, and options are considered as to how this goal may be reached. While a combined system would undoubtedly have advantages for some fungal groups, it will also bring deep nomenclature implications for the whole fungal kingdom. The authors also bring up a provocative but interesting idea, i.e. in the process of reaching a unit nomenclature all names of different morphs should equally compete for priority.

The following papers deal with more specific classification problems in selected genera of the Hypocreales (6 papers), Dothideales (4 papers), Sordariales (1 paper), and in some polyphyletic anamorph genera including *Graphium, Phialophora, Aspergillus* and *Chalara*. Papers are presented by leading specialists in their respective fields with the underlying idea that genera should ideally be monophyletic. Many of the papers contain new original research, particularly coming from molecular studies, while others provide an up-to-date review of previously published research.

The volume is carefully edited by the organizers of the two symposia. An index to fungal names and frequent cross-references in the text make the breadth of information covered by this paper collection more easily accessible. One might perhaps wish that some of the introductions would have been shortened more

rigorously since often the same concepts and ideas are reiterated in different papers.

Overall, I found this volume very stimulating to read, although not everyone will agree with all the personal views expressed by the authors. Nevertheless, I am convinced that many of the challenging ideas communicated here will provide the guidelines for taxonomic research in the years to come.

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Ulloa, M. & R. T. Hanlin (2000). Illustrated dictionary of mycology. – APS Press, St. Paul, Minnesota 55121-2097, USA; ISBN 0-89054-257-0. $8^1/_2'' \times 11''$, hardcover, 448 pp; 1322 black and white illustrations, Price: US$ 99. –, excluding posting and handling.

Over 3,800 mycological terms are defined along with their etymological derivations in this hardcover dictionary. Most terms are illustrated with seven hundred seventy four black and white photographs and 548 drawings.

This Dictionary is a completely revised and enlarged version of the Spanish edition issued in 1991 and now includes almost twice as many terms and 80% more illustrations. Its translation from Spanish into English demonstrates that the concept applied in the original version was very successful. Indeed, something similar was missing in English.

The definitions are based mainly on Alexopolous & al (1996) and the Ainsworth's and Bisby's Dictionary of fungi 8th ed. (Hawksworth & al., 1995). An appendix provides an outline of the classification of the fungal taxa down to the genus level based on these references. For completeness the phylum Ascomycota is also outlined according to Eriksson & Winka (1997). Two double spaced pages explain abbreviations and symbols. This is very useful, as it is needed to explain the etymologies of the terms.

The terms considered refer almost exclusively to morphology, structure, and growth habits in nature and in culture, but a few ecological definitions and general biological terms are also reported. References to authors, fungal classification and their phylogeny, as well as fungal names are omitted, as those are contained in the widely distributed Dictionary of fungi. Definitions are clear and simple, but of high technical standard. Contrarily to the Ainsworth's and Bisby's Dictionary, no literature or contrasting interpretations are reported.

The main strength of the "Illustrated Dictionary of Mycology" is certainly the large number of illustrations used to explain many of the terms. The illustrations represent original features taken from fungal examples and are not just schematic drawings. They were finalised with Adobe® Photoshop®, and their quality is outstanding. The many black and white photographs and drawings are of high quality and very informative. Arrows often point to the character shown, thus making it easy to understand the meaning of the morphological terms.

In addition, the etymologies provided for each entry are a unique source not only to students, but also to teachers, as they allow one to learn about their origin and derivations, and help to understand and memorise better the fungal terminology.

The large US-letter format printed with two columns per page and the entries in bold facilitate searching and reading very much. An additional help is given by the headers, that indicate the pages' first and last words. The illustrations are inserted close to the respective entries for quick retrieval. The hardcover and robust binding allow the book to stay open and to resist a frequent use.

I am very pleased by this book. Not only the content and its presentation are outstanding, but also great emphasis is given to the language. I am convinced that The illustrated Dictionary of Mycology will soon be part of the standard books in taxonomical mycology. It will be useful, however, also to adjacent fields, such as plant or forest pathology, as well as to anyone who wants to know what is what in fungi.

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