

NEWSCORNER

D.J. McLaughlin E.G. McLaughlin & P.A. Lemke (vol. eds.): Systematics and Evolution, Part B. In; K. Esser & P.A. Lemke (eds.): The Mycota VII. – Springer Verlag Berlin Heidelberg New York 2001, 259 pp. ISBN 3-540-66493-9

This intriguing book written by leading specialists in their fields consists of three main parts (Fungal Hierarchy, Nomenclature and Documentation, Evolution and Speciation) plus a subject index and a biosystematic index. Under Hierarchy, five chapters deal with basidiomycetous yeasts, Urediniomycetes, Ustilaginomycetes, Heterobasidiomycetes and Homobasidiomycetes. The taxa in the first chapter are treated together because of their life forms rather than their close phylogenetic relationships, and they all belong to one of the groups treated in the next four chapters. This arrangement is based on current general practice and tradition and should not be blamed on the authors/editors, although it would have been refreshing – and now also possible – to include the yeasts with their phylogenetic relatives rather than still treating them as a life form. The overall presentation is short, concise and clear and provides an updated overview of these major taxa. Although they are familiar to all students of basidiomycetes, only the most eager front-line researchers and students of the group will not be surprised by one or other of the new delimitations of taxa presented. This undoubtedly represents the major lines of future phylogeny and probably quite soon also the taxonomy, when the proposed trees have been supported with additional taxa.

The book is a must for teachers of mycology who do not want to suffer from idle corrections by students not hampered with the old/previous taxonomic systems. It has been common knowledge for a 100 years that truffles are not related but are a shared life form for hypogeous fungi. Later, we learned to accept lichenised basidiomycetes and mycorrhizal ascomycetes, and that some traditional Heterobasidiomycetes with a simple dolipore belong to the smuts (e.g. *Eocronartium*), and also that the type of hymenophore in the Hymenomycetes is a much overestimated criterion for distinguishing taxa at higher levels. Now, we must also accept that longitudinally and transversely septate basidia can be closely related and that Gastromycetes are “only” gastromycetes or gastroid fungi, originating several times during evolution. We have to accept that some classical and much-used-for-demonstration smuts turn out not to be smuts but highly convergent, disguised rusts! (*Ustilago* species not occurring on Poaceae, e.g. *U. violacea* etc.).

It is time for a reconsideration of textbooks and lecture notes etc. by all mycologists in order to adapt the new data and help establish the new concept of these fungi. The system is maybe more complicated and less clear-cut in some ways, but in other ways also astonishingly simple when the

“correct” characters are used for distinction. Thus, only a few characters are necessary to separate the three major lineages of basidiomycetes, the Urediniomycetes, the Ustilaginomycetes and the Hymenomycetes: the composition of cell wall carbohydrates, nucleotide sequences of the SSU rRNA, and the structure of the septal pores.

The second part of the book includes chapters on the naming of fungi, cultivation and preservation of fungi in culture and computer-based systems for assistance in taxonomy and documentation. The section on Evolution and Speciation has two chapters. The chapter on speciation phenomena gives an overview of various factors that restrict or promote gene flow. The last chapter on molecular evolution by Berbee and Taylor is a follow-up of their 1993 paper (*Can J Bot* 7:1114–1127) reporting the use of a molecular clock to date specific evolutionary events. Compared with their paper, the chapter here uses a new data set on SSU rDNA with more sequences from basal zygomycetes and chytrids. This has moved the estimated origin of the terrestrial Eumycota several hundreds of millions years back, so that the fruitbody-forming Ascomycota may date back 400 million years.

Summing up, the reader is presented with useful, necessary and even exciting information and the book will be excellent for many teachers and students. Each chapter finishes with comprehensive and up-dated references. From the viewpoint of an orthodox taxonomist, some minor comments could be addressed to the use of Eumycota instead of Fungi for the kingdom. The argument presented in favour of this is that Fungi are an ecological group (!). This is an unfortunate and unnecessary change with some odd implications: a phylum, the Eumycota, thus includes four other phyla (Chytridio-, Zygo-, Asco- and Basidiomycota), which is not possible. Also the code recommends that new taxa published in books and similar places (as on p 113, *Cystofilobasidiaceae* K. Wells & Bandoni) should be announced at the beginning of the book. For the Homobasidiomycetes, eight well-resolved clades are presented. They include very few genera among the simple, corticoid forms, e.g. with supernumerous sterigmata and simple fruitbodies. Hopefully, more of these will be included soon to determine whether this number of clades is constant or whether more sampling in the “lower” area will create more clades.

However, these are details and the editors and authors should be congratulated for this exciting and very readable overview of the basidiomycetes. The most recent data are presented in an encouraging way, inviting both experienced as well as less-experienced mycologists to dig further into the increasingly interesting fungal universe. The book is highly recommended for all with a future in mycology!

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