

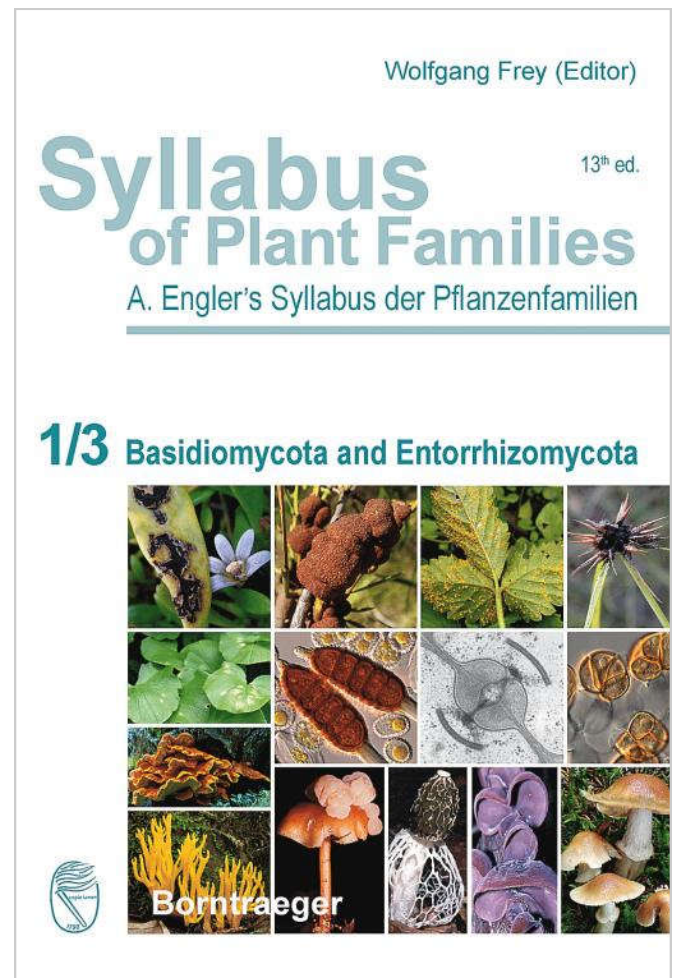
## Book Review

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Begerow, D., McTaggart, A. R. & Agerer, R. (eds.) 2018. *Basidiomycota and Entorrhizomycota [Syllabus of Plant Families: Adolf Engler's Syllabus der Pflanzenfamilien, 13th edn (Wolfgang Frey, ed.), Part 1(3)].* Stuttgart: Borntraeger Science Publishers. 471 pp. Hardcover, ISBN 978-3-443-01098-0. 139 €.

In its title and structure this book follows the tradition of the past century; meanwhile it attempts to clarify the systematic state of one very relevant group of fungi by summarising the most recent phylogenetic results. To date, the evolutionary relationships of fungi and fungi-like organisms have been accurately mapped from barcoding sequences and phylogenetic reconstructions (see Gaya et al. 2018); however, due to the early morphology-based perception and the legacy of early botanical works, the “non-photosynthetic cryptogams” are still traditionally handled if they are “close” to the kingdom of plants (for example, mycological journals mostly list them under the category of “Plant Science” in scientific databases).

One of the early decisive botanical works was edited by Adolf Engler, the “*Syllabus der Pflanzenfamilien*”, published in 1892. In line with the contemporary perception, fungi species (together with lichens) were discussed among plants, although only covered 21 pages. Since the first edition, treatment of this very diverse and heterogeneous group has expanded and now encompasses 1000 pages in the 13<sup>th</sup> volume of the new series. The first volume of the new series was published in 2012 under the following title: “*Blue-green Algae, Myxomycetes and Myxomycete-like organisms, Phytoparasitic protists, Heterotrophic Heterokontobionta and Fungi p.p.*” (Part 1/1, 178 pp., with 55 figures). This was followed by the second volume reviewing the phylum of sac fungi (Ascomycota), which was published in 2016 (Part 1/2, 322 pp., with 8 figures and 16 colour plates). The current volume of the series discusses another large phylum of the Dykaria group, the Basidiomycota, as well as the Entorrhizomycota phylum which was formerly separated from it (see Bauer et al. 2015). The latter has no sufficiently clear systematic state (Spatofora et al. 2017; Hibbet et al. 2018). It contains only two small genera, *Entorrhiza* and the monotypic *Talbotiomyces*; both are root parasites, with the former infesting members of Cyperaceae and Juncaceae worldwide. The Basidiomycota are an economically important and extremely diverse group of Fungi (viz. mushrooms, smuts, rusts, yeasts, etc.), with c. 36.000 species, 35% of the described species of true Fungi. In the case of such a diverse group with a very large species number it is a huge task to review and summarise the most recent phylogenetic results. Despite this, the work was undertaken by just three mycologists. The Agaricomycotina subdivision, containing 80% (1481 gen.) of all the genera, was prepared by Reinhard Agerer alone, while



Domink Begerow and Alistair McTaggart produced the other three sections (Pucciniomycotina, Ustilaginomycotina and Entorrhizomycota).

Following an order-level synopsis, the volume presents the two phyla in systematical order, where the genus is the lowest shown taxonomical unit. In addition to morphological traits, the species belonging to the genera, their life-styles and their distributions are all discussed. In several cases there are further remarks, notes and relevant citations in the text. Although the references are listed after every subdivision, for many taxa it is not clear which literature is the source of a given information (e.g. background of the taxonomical acceptance of the genus, its species number, description of its morphological traits), or which systematic concept was followed. In contrast to the former volume of Ascomycota, in this work the synonym names are not mentioned; furthermore it would have been helpful to indicate the years after the author names. While the type species are given for some of the groups, they are missing for Agaricomycotina. In most cases the genus concepts follow a rather narrow phylogenetic concept, but the acceptance of families is sometimes more conservative.

Although such a synthesizing work can never be fully finished due to ongoing changes in the various systematic concepts and with newer results constantly being published, this volume should be a very effective tool in the hands of researchers working on applied mycology, and for experts interested in this group of fungi, as well as for teachers and students. Nowadays there are internet sites being developed based on a wider collaboration, that are intended to be used in a similar way to search for the modern systematic state of fungi (e.g. Index Fungorum), and some of these also provide morphological descriptions (e.g. MycoBank Database). However, there is no recent work containing up-to-date phylogenetic results concerning this group in book format, and edited based on a more or less uniform criteria system. Thus this volume should be on the shelf of every mycology institution and department, and of individuals who are interested in the systematics of the division *Basidiomycota*.

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Scarlet waxcap (*Hygrocybe coccinea*), Hungary. Photo: P. Finy.