

BOTANY

The Agaricales in Modern Taxonomy

By R. Singer. 1986. Fourth revised edition. Koeltz Scientific Books, Koenigstein, West Germany. 981 pp., illus.

This book is **the** standard technical guide to the genera of mushrooms in the world. It goes without saying, that all major taxonomic mycological libraries should acquire this publication. While the author's opinions also have a profound affect on how regional mycofloras and field guides are worded, the text itself requires a number of years of study to be usable. Over 5000 species of agarics are listed in 230 genera in 16 families. As in previous editions, there are complete descriptions of the genera, keys to the families and genera, and a lengthy synopsis of techniques, characteristic features, and history. To understand some of the impact of this book one has to be aware of its history and that of the author. Dr. Singer has been publishing continuously on mushroom taxonomy since the age of 16 in 1922. He has authored over 300 publications in English, French, German, Russian, Spanish, and Latin. He has collected and studied worldwide, notably in Europe, the U.S.S.R., and North and South America. This book has as its precursors two war time series published under unusual circumstances, *Das System der Agaricales* 1936–1943 (*Ann. Mycol. (Berlin)* 34: 286–378; 40: 1–132; 41: 1–189) and *Phylogenie und Taxonomie der Agaricales* 1939 (*Schweiz. Zeit. f. Pilzk.* 17: 23–28, 35–39, 52–57, 71–73, 84–87, 97–101). The first edition was actually published in a journal (*Lilloa* 22: 1–832. 1951), followed by editions in 1962 and 1975 by Cramer. His contributions to the understanding of agaric taxonomy are rivalled by those of only two other contemporaries, R. Kühner (France) and A. H. Smith (USA). Neither has had as great an impact on generic concepts, but rather they have excelled in other ways.

Field biologists, amateurs, and plant pathologists often complain about the proliferation of new names, resurrection of old names, and shifting concepts in mycology, particularly for the conspicuous fleshy fungi. These opinions should be tempered by the fact that our knowledge of the fungal flora and, in many respects their taxonomy, is 100 years behind that of vascular plants and by the fact that mushrooms are large fructifications of microorganisms. Through the years, Dr. Singer has published countless new specific and generic names, and new combinations. There are nearly 100 new

names in the Fourth edition, which includes four new species, and one new genus, *Janauaria* from South America. Unfortunately each of the new species has only a minimal description and no illustrations. Several vital features are omitted, e.g. spore sizes are given for only one, and the number of spores per basidium is not given.

One major digression from the previous edition was the removal of two genera with luminescent species, *Omphalotus* and *Lampteromyces*, from the Tricholomataceae (suborder Agaricineae) to the Paxillaceae (suborder Boletineae), based on biochemical studies in Dr. Bresinsky's laboratory. Whereas in the first two editions there were many massive shifts between genera or to new or newly recognized genera, based on new data, there has been a stabilization in the last two editions. This is the inherent value of Dr. Singer's opus, it is a cohesive and comprehensive monograph. Unfortunately such a tome has tended to suppress many good proposals by others which are contrary to Dr. Singer's views. Most genera proposed or resurrected by others in the intervals between editions are placed in synonymy, e.g. *Lentinula*, *Megacollihya*, *Rickenella*, *Gammundia*, *Conchomyces*, *Ossicaulis*, *Caulorhiza*, *Calathella*, *Cephaloscypha*, and *Phaeogalera*, although a few genera treated by others have been accepted, e.g. *Fissolimbus*, *Agaricochaete*, *Horakia* etc. Students of basidiomycete taxonomy would do well to keep an open mind on such matters and restudy the discussions on evolution, tissues types, ultrastructure, cultural features, or pigmentation by E. J. H. Corner, R. Kühner, D. Pegler, J. Ginns, E. Horak, and/or H. Cléménçon, before accepting R. Singer's classification in total.

Dr. Singer mentions that this is probably the last edition of *The Agaricales in Modern Taxonomy*, thus it seems appropriate and instructive to examine some of its basic premises. Recognition of a single order with suborders for the genera treated therein was justified by the statement (p. 147), "... This is in my opinion the logical step as long as we wish to maintain the Agaricales as a definite unit within the Basidiomycetes." This is somewhat illogical because the Agaricales can always be maintained as a definite unit but with different parameters. Increasingly, it has become evident from data in recent literature that the gilled mushrooms arose more than once, giving rise to more than one order. Dr. Singer admitted this at least in the case of the

lamellate genus *Lentinellus*, which was included in the Agaricales in editions 1 and 2, but excluded in 3 and 4, all while maintaining the Agaricales as a unit. A second premise is the assertion that Gasteromycetes (puffballs and allies) gave rise to some or all Agaricales. For over 50 years Dr. Singer has defended this idea and 17 pages are devoted to the discussion in this edition (pp. 131–145, 807–808). Accordingly none of the gasteroid agaric genera, e.g. *Gasterocybe*, *Thaxterogaster*, are included in the Agaricales. Many mycologists are not convinced by Dr. Singer's evidence and include various gasteroid genera in the Agaricales (see Savile's 1968 paper, Possible interrelationships between fungal groups, in *The Fungi*, Volume 3, pp. 649–675).

A number of taxonomic features pertinent to phylogenetic studies of agarics were overlooked or not accepted by Dr. Singer. First, the ability of a fungus to produce enzymes which selectively remove cellulose from wood (resulting in a brown rot) has proven to be a useful feature which is correlated with anatomical or morphological features in taxonomic studies of polypores. Similar studies amongst agarics support the recognition of (1) *Lentinula* for the Shiitake as promoted by Pegler, rather than *Lentinus* as maintained by

Singer, (2) *Neolentinus* and *Ossicaulis* as proposed by Redhead and Ginns contrary to Singer, but (3), also support recognition of *Hypsizygus* as proposed by Singer rather than synonymization with *Pleurotus* as maintained by Corner. Second, further research on sarcodimitic tissues, first recognized by Corner in 1966 but largely unaccepted by Singer, supports the recognition of the genera such as *Megacollobia*, *Caulorhiza*, *Gerronema* (in a very restricted sense), *Hydropus*, and *Xerula*, but does not support recognition of a large genus *Trogia* as originally proposed by Corner. Finally, studies on the lichenization of agarics have also led to the modification of generic limits different from Dr. Singer's.

The Agaricales in Modern Taxonomy remains the standard for mushroom taxonomy and is unlikely to be surpassed for depth and coverage of the Agaricales by any text in the coming century. We all owe a great deal to Dr. Singer.

S. A. REDHEAD

Biosystematics Research Centre, Agriculture Canada, Ottawa, Ontario K1A 0C6

Physiological Ecology of Lichens

By Kenneth A. Kershaw. 1985. Cambridge University Press, New York. 293 pp., illus. US\$59.50.

Physiological Ecology of Lichens has been winning accolades in the academic world. This marks one of the first times a Canadian author has made significant impress on a discipline which, to judge from the dominance of lichens in our landscape, ought to be a Canadian specialty.

It must be admitted, however, that Kershaw's book is not likely to find a place in the library of the average field naturalist. Its text, written primarily for the professional researcher, will be only marginally accessible to amateurs not intimately conversant with the techniques and vocabulary of plant physiology.

This is not to say that *Physiological Ecology of Lichens* is without interest to naturalists, but rather that they will want to consult this book rather than to buy it. Throughout his book, Kershaw places special importance upon the desirability of understanding the workings of lichens *under field conditions*. The fact that it is the micro-environment of a lichen which is important to its ecology, and not its gross environment, could be easily construed as

Kershaw's central message. Time and again he urges his colleagues to pay closer attention to microclimate, arguing that until they do this, the results of their experiments will bear little or no relationship to what he calls "the operating environment" of lichens.

Having said which, perhaps it is appropriate that the most readable chapters of the book — at least to the layman — are the first and second, in which Kershaw presents a lucid introduction to the thermal and hygric environments under which lichens operate, and the last, Chapter 9, which discusses various possible physiological and morphological responses of lichens to different microclimatic conditions. The remaining chapters are devoted to technical overviews of first the ionic environment of lichens (3), and then their major physiological functions, namely nitrogen fixation (4), photosynthesis (5,6,7), and respiration (8). Following Chapter 9 is an extensive reference section listing about 400 titles (60 of which are the author's own!), and an index. The text is illustrated by two plates, seven tables and 174 figures. Unfortunately for the uninitiated, there is no glossary of terms.



Redhead, Scott A. 1988. "The Agricales in Modern Taxonomy, by R. Singer [Review]." *The Canadian field-naturalist* 102(2), 402–403.
<https://doi.org/10.5962/p.356574>.

View This Item Online: <https://www.biodiversitylibrary.org/item/89713>

DOI: <https://doi.org/10.5962/p.356574>

Permalink: <https://www.biodiversitylibrary.org/partpdf/356574>

Holding Institution

Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Sponsored by

Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Ottawa Field-Naturalists' Club

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.