# Book Reviews

Carroll, G. C. & D.T. Wicklow (1992). The fungal community. Its organization and role in the ecosystem. 2nd Ed. (1st Ed.: 1981).– Marcel Dekker, Inc., New York, Basel, Hong Kong. 976 pp. ISBN 0–8247–8605–X. $ 225.–

The first edition of "The fungal community" was produced in the effort to integrate fungal ecology in general ecology.

In the introduction to the first edition the editors have suggested that 'the eventual contribution of "fungal ecology" to the development of ecological theory will depend... on whether "fungal ecologists" are willing to ask more penetrating questions of their data... and fungi as an organism group [could] provide a number of satisfactory experimental tools...'. The success encountered by the first edition testifies of the willingness of mycologists to take up ideas and methods since long time established in general ecology. The marked changes in the second edition in titles and authors, combined with a deeper treatment of theoretical and practical aspects of population and community biology, confirm that fungi are more than satisfactory experimental tools in experimental ecology and at the same time reflect the real advances in understanding and approaching fungal ecology problems.

The first edition of the book has often been defined as one of the most significant contribution to the study of the fungal ecology. The second edition is certainly a milestone in the history of mycology and I dare say that it will become one of the most cited references also in general mycology, since it contains information that is relevant not only to fungal ecology but also to several other mycological research fields .

Alan Rayner, in his Introduction, stimulates the readers to approach fungal ecology from a novel point of view, namely by taking into account the way fungi organise themselves. Even if one may not agree with Dr. Rayner's ideas, the introduction is thought–provoking and aptly prepares the reader to the wealth of information that makes this book almost an encyclopaedia of fungal ecology. Since my review aims at showing at a glance the contents of the book, I refer the readers interested in philosophical considerations to Dr. Rayner's introduction and I shall limit myself to give a broad overview of the organisation of this volume.

"The fungal community" is organised in 9 large sections, each containing at least two (Part I) to nine chapters (Part IX), for a total of 44 contributions.

An excellent review by D. Strong of the implications of non-equilibrium theory in fungal communities opens Part I and the book. This theoretical chapter is followed by a more experimental one on the significance of V–A mycorrhiza in the ecosystem by Trappe and Luoma.

Part II comprises papers on fungal population and the niche concepts. Anderson, Kohn and Leslie present an overview of genetic mechanisms in fungal adaptation. The chapter by Theodorou & al. on rumen fungi provides a much needed synthesis and overview of the knowledge that has now accumulated on this extremely intriguing group of organisms. Two additional chapters are dedicated to the photosynthetic activity of lichens and to the fitness of genetically altered fungi.

Part III contains chapters that summarise the present knowledge on the organisation of fungal populations and communities, and two more technical chapters on molecular techniques and numerical methods, which had perhaps been placed better in Part I.

In Part IV seven chapters discuss the theoretical and practical aspects of species interactions in fungal communities. The introduction to the theory of species interactions by D. Culver is a short, compact and yet very comprehensive and understandable compendium of theoretical aspects of species interaction. Most of the other chapters in this section update information already contained either in the previous edition or in other similar reviews.

For a scientist interested in the study of the patterns of community development, Part V is a fascinating compendium of the most diverse research topics in community analysis. M. Dick's review of phenological patterns in populations of zoosporic fungi is a good blend of theory and experimental data, Juliet Frankland's presentation of the mechanisms acting in fungal succession is likely to become a standard reference not only for research but also for teaching courses. The chapters on soil fungal communities and experimental disturbance also contain very useful information.

The influence of mycorrhizae (Allen & Allen) and fungal pathogens (Alexander) on plant community development and the long-term ecosystem changes in dependence on the development of plant pathogen populations (Dickman) are described in Part VI. Part VII gives an excellent introduction to the aspects of ecology that are related to biomass production in ecosystems. The central chapter of this section is certainly the outstanding and comprehensive review by S. Newell of the methods used to estimate fungal biomass and productivity in decomposing litter. The two contributions by Vogt & al. on sporocarp production by Basidiomycetes and by Boucher & Stone on epiphytic lichen biomass present useful information on theoretical approach and experimental methods in two different fields of fungal ecology.

Six chapters are dedicated to the impact of fungi in nutrient cycling. I was particularly impressed by the contributions by Wainwright on the role of fungi in nutrient cycling, by Ingham on the effects of grazing on fungi, with particular emphasis on the models mycorrhizae–invertebrates and root pathogens–invertebrates, and by Moorhead & Reynolds on ecological modelling. The latter chapter contains very useful and clear information on the four main decomposition models and is written to introduce inexperienced ecologists to understand the ideas behind ecological modelling.

The last Part contains nine contributions. Wicklow describes the coprophilous fungi and their significance for the study of ecological problems. Suberkropp's review of aquatic hyphomycetes communities provides an exhaustive compendium of methodology and experimental results, including some data on enzymatic activity by this group of organisms. Lynne Boddy describes the fungal communities of wood, Hill & Patriquin the interactions between fungi and nitrogen-fixing bacteria during decomposition and emphasise the role of fungi as $O_2$-scavengers and N-immobilizers, while Blakeman presents a useful discussion of the most important antagonists present on plant surfaces. The alteration of fungal communities in integrated management is discussed by Reeleder and the experimental approach to island biogeography is described by Wildman in the last chapter. I particularly enjoyed reading the very comprehensive and informative presentation by Nout of the ecological aspects of mixed-culture food fermentations, in which not only the basic theory of physical and chemical aspects of the colonisation of food by fungi is discussed, but also an exhaustive and compact enumeration of the most important fungal organisms used in fermentation is given.

A systematic index and a subject index complete this almost 1,000 pages long book.

The second edition of "The fungal community" is a magnificent book and an extremely important contribution to fungal ecology which deserves a string of superlatives. A very welcome feature of the book is the blend between theoretical and experimental chapters. Many authors have provided valuable technical information, at the same time pointing out the biological relevance of the procedures they describe. In experimental chapters, on the other hand, the authors have also given indications about technical help needed to progress.

As it can be expected in such a large book, not all contributions live up to the expectations. Some authors have presented material that can already be found in other reviews, some chapters are either too compact and concise to be adequately informative and others could have been shortened without loss of information. These, however, are only minor criticisms. "The fungal community" is and will remain the most important reference in fungal ecology.

When I gave my first course in fungal ecology in 1983, I was building up my teaching on the information contained in the first edition of "The fungal community". Ever since I have been using it and recommending it to my students. On the other hand, already the first edition was outrageously expensive and not affordable for researchers and students, so that the few copies present in our library were usually unobtainable. I strongly hoped that Marcel Dekker would change its price policy with the second edition. Unfortunately, the price change was not the one I was expecting and the second edition is even more expensive than the first one is. Since I consider this book almost a must for fungal ecologists and mycologists in general, I think that its price should also be set to be affordable by personal purchasers and not only by libraries. Sadly, I am afraid that exactly because of the price this book will find a place only on the bookshelves of departmental libraries and not on those of each mycologist interested in ecology, as it actually ought to be.

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## Reed, C. F. & D. F. Farr (1993). Index to Saccardo's Sylloge Fungorum Volumes I–XXVI in XXIX, 1882–1972.– Contribution No. XXXI of the Reed Library and Herbarium, Darlington, Maryland; contribution No. 6 from the U.S. National Fungus Collections, Beltsville Maryland; Rose Printing Company, Tallahassee, Florida. Hardback $ 75, Softback $ 60, plus $ 4 for shipping. Obtainable from Clyde Reed, 1222 Main St., Darlington, MD 21034, USA.

Saccardo's Sylloge Fungorum, published between 1882 and 1972, is the most widely used standard reference in fungal taxonomy. It gives access to fungal descriptions, to authors of fungal taxa, and to the most important literature references on given taxa. Because of the wealth of unfortunately unclassified information contained in the Sylloge, it has however always been time consuming to search for a given taxon name, especially when not listed in the first volume, since a cumulative index is lacking. Hence the need for a general index to the whole opus. The Index to Saccardo's Sylloge Fungorum Volumes I–XXVI in XXIX, 1882–1972 by Reed and Farr now provide the much needed cumulative index to the 26 volumes of Saccardo's Sylloge fungorum. Only Vol. 13, which contains the index to the names of host plants, has not been included.

The problems encountered in, and the objectives set for the compilation of the index are briefly described in the Introduction. Pagination problems, especially those referring to the Edwards reprint (Edwards, 1944), are mentioned. Copies of four missing pages in this reprint are supplied at the end of the index, thus making the purchase of the index particularly attractive also for owners of the Edwards reprint. The compilation of the index with a computer database has allowed to compute the total number of names (121,627) listed in the database, the distribution of names by volume number, the number of genera with the specified range of species, the frequency of species names used several times, and the percentage of species names starting with a given letter of the alphabet. While some information is relevant, other can be just amusing. For instance, it may be useful to know that the most common species epithet is *elegans*, occurring 151 times, and amusing that species epithets starting with the letter c account for 12.5 % of all species epithets.

The conspectus to the Sylloge Fungorum includes 10 pages and lists title, authors, page number, publication date and place of each volume, followed by a list of contents giving an overview of the taxonomic groups, according to the Saccardoan system. Orders, families, and sections treated are enumerated with the page numbers of the corresponding volume. According to the table of contents and a remark in the introduction, the authors planned to place the systematic conspectus after the index at the end of the book, but it has been inserted right after the introduction, which, I think, is actually better. The main part, 844 pages, contains the index to the names in the Sylloge Fungorum. 4827 fungal genera are listed alphabetically. For each name the author, the bibliographic reference, the numbers of the volumes in which the name is cited and the fungal order or family are given. Within genera, the species names, followed by the volumes and page numbers of their citations, are also arranged in alphabetic order. Synonyms have been entered as well and the correct name according to the Sylloge has been given in brackets. This procedure has been followed consequently also for species of *Sphaeria*. Inconsistency of spelling have been resolved, whenever possible, according to the currently used spelling based on the Index nominum genericorum (Farr & al., 1979) and the Dictionary of fungi (Hawksworth & al., 1983), or alternative spellings have been proposed in brackets.

Behind this Index hides a tremendous work of several years. Clearly, only the computer could make it possible. Without doubt, this index is an invaluable tool for taxonomists. The original descriptions and references can be tracked down quickly without having to do painstaking literature work in the Sylloge. The new index allows also a more efficient literature search to taxonomists that have no direct access to the Sylloge. The uptake of monographic work will certainly be facilitated by the use of this cumulative Index.

The moderate price is also a definite bonus, since it allows not only libraries but also personal users to purchase this welcome addition to the Sylloge Fungorum.

## References

Edwards Brothers, Inc. (1944).– Ann Arbor, Michigan.

Farr, E. R., J. A. Lousing & F. A. Stafleu (1979). Index nominum genericorum (plantarum). Vol. 1–3.– Bohn, Scheltema & Holkema, Utrecht, Netherlands, 1896 pp.

Hawksworth, D. L., B. C. Sutton & G. C. Ainsworth (1983). Ainsworth & Bisby's Dictionary of the fungi. 7th Ed.– Commonwealth Mycological Instute, Kew, England, 445 pp.

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Nag Raj, T. R. (1993). Coelomycetous anamorphs with appendage-bearing conidia. Mycologue Publications, 331 Daleview Place, Waterloo, Ontario N2L 5M5 Canada. 1101 pp., 469 figures and 8 plates. US $129.00.

This book seems destined to become a mycological classic. It includes complete descriptions and detailed illustrations of 423 species (40 new) in 142 genera (10 new). The title might make the subject appear somewhat esoteric, but this is not the case. The fungi described include important plant pathogens in such genera as *Pestalotia* sensu lato, *Colletotrichum* and *Phyllostica*. A revision of some species formerly ascribed to the mycotoxigenic genus *Myrothecium* is also included. The quality of the line drawings elevates the treatment of less well-known species into the realm of mycological art occupied by the works of the Tulasnes.

The introductory chapters provide a brief historical review, a detailed review of morphological characters, a discussion of generic concepts and notes on collection and examination of material. The review of characters is central to understanding and using the book. Dr. Nag Raj distinguishes eleven types of conidium appendage by developmental and morphological criteria. The method for describing conidium ontogeny introduced by IMI in the early 1980's (informally known as the Minter system) is used throughout. The taxonomic part begins with dichotomous and synoptic keys to the genera, followed by the taxonomic treatments. The genera are presented in alphabetical order, and each of these chapters contains a generic diagnosis, dichotomous and synoptic keys to species where appropriate, descriptions and illustrations of the type and additional examined species, details of typification, and a list of excluded or unexamined taxa. The book concludes with a glossary, a fungus index, and a host index. The book is well bound, and despite its size, does not need to be coerced into lying flat on a table. The text is presented in a single column format and is easily readable. The drawings are large, often filling a whole page. The sheer bulk of the book is reminiscent of a PhD thesis, but there is little wasted space. A comparison with B. C. Sutton' 1980 monograph, "The Coelomycetes" seems inevitable. Dr. Sutton's book treated 750 species from 375 genera. Only about 40% of the species in Nag Raj's book are also considered by Sutton. Sutton was primarily concerned with genera; the descriptions of species were brief and the illustrations varied in detail. The emphasis in Nag Raj's treatment extends to species and no detail is excluded. The generic concepts adopted by these two authors differ in many cases. As an example, Nag Raj has dispersed the species accepted in *Seimatosporium* by Sutton into five anamorph genera, based mostly on differences in the conidium appendages.

The two criticisms I can make would be acknowledged by Dr. Nag Raj, and are inherent in the nature of the task. First, the range of material examined for most species is limited to the type. This reflects a paucity of material, in most cases, and also the fact that in the finite life time of one man it is impossible to recollect a significant number of these species. This leads to the second criticism, the shortage of cultural data. It is true that describing a coelomycete from agar culture alone is ill-advised. But this does not obviate the fact that plant pathologists often face these fungi either as sterile or immature leaf spots or as cultures isolated from diseased material.

This book is more than the sum of its parts. The depth of coverage bespeaks a passion and a patience that is rare among contemporary taxonomists. In the tradition of true scholarship, the book captures the substance of one man's life work for the benefit of future generations. While the rest of us scramble around, describing the odd new species or revising a few genera, distracted from our true purpose by paper work, computers and the fight for resources, Dr. Nag Raj has reminded us what taxonomy is supposed to be.

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