Book Reviews

Frisvad, J. C., P. D. Bridge & D. K. Arora (eds. 1998). Chemical fungal taxonomy. – Marcel Dekker, Inc. New York, 424pp with illustrations. ISBN 0-8247-0069-4, hardcover. Price 175 $.

Fungal taxonomy stems from classical botanical approaches: Most currently used taxonomic characters are based on the morphology of reproductive structures and on fungus-host relationships. The available morphological features, however, are often scant and not sufficient to reliably identify closely related species or poorly differentiated organisms such as the yeast. The need for new approaches towards a reliable taxonomy for fungi is evident and progress has been made during the last two decades to develop good and reliable molecular biological methods and analytical tools.

Identification of fungi is not only an academic task. Fungi are involved in food production and biodeterioration, health care and plant pathology, and are extremely important also in biodiversity and population studies. Modern molecular techniques are now routinely applied to fungal taxonomy and are currently under evaluation as reliable identification tools for important fungal groups or to identify phylogenetic relationships. While these methods are undoubtedly of enormous importance, they are often still used only by specialists and the results of such analyses are seldom compared critically with those of classical methods. In addition, only a selected number of classical, fungal taxonomists are actively dealing with, and consulting the results of chemical and molecular biology taxonomic work.

This new book is intended to fill the lack of information on chemical and molecular biology taxonomy. It provides a broad range of information on techniques and their applications in one volume. Nearly a thousand references are given, thus also providing an invaluable source of literature. Various experts have been asked to review the methods which they are routinely using and to critically comment on their practical applications. Fourteen chapters offer detailed overviews of selected methodologies. The first chapter is dedicated to an overview on chemical fungal taxonomy written by the editors. The following chapters cover numerical analyses of fungal chemotaxonomic data (Bridge and Saddler), DNA techniques (Edel), the use in fungal taxonomy of protein (Hennebert and Vancanneyt) and isozyme analysis (Rosendahl and Banke), as well as the value of the analysis of polysaccharides (Leal and Bernabé), unsaponifiable lipids (Paterson), fatty acids (Kock and Botha), carbohydrates (Pfyffer), volatiles (Larsen), and secondary metabolites (Frisvad et al.) in fungal taxonomy. Immunological methods for rapid identification of fungi (Notermans et al.) and the influence of growth conditions on secondary metabolites (Frank) are discussed as well. The book closes with a chapter on the use of metabolic data in lichen-forming fungi. An index of fungal names and subjects is provided.

The possibilities and limits of the various biochemical and physiological approaches to fungal systematics are critically outlined by the authors, who, however do not advertise their own fields of expertise as the ultimate solution to taxonomic problems, thus making the book a well-balanced and critical analysis of the techniques available. The authors encourage the researchers to compare and discuss

results obtained by different "modern" and classical methods. As a rather classically oriented mycologist, I found most chapters very useful, as they provide a comprehensive insight into the various new disciplines. I also enjoyed reading the introductory chapter on numerical analyses and I welcomed the possibility to find a large body of references otherwise difficult to collect.

Without doubt, "Chemical fungal taxonomy" will be an excellent reference book for all mycologists. The robust hardcover is designed to withstand extensive use. Most of the research groups and libraries must buy this book. For a student, however, the book comes at a perhaps too high cost to justify buying it.

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Holliday, P. 1998. A dictionary of plant pathology, 2nd. Edition. Cambridge University Press, U.K., 536pp. ISBN 0 521 59453 7, hardback, £ 85.00, US$ 150.00.

Ten years after the first edition, the fully revised, second edition of the dictionary of plant pathology is available. Over 11,000 entries, including 3,000 new ones, are commented, updated and expanded. The main part refers to authoritative names of plant pathogens: Other entries refer to biography, crops, their pathology, disease names, disorders, and any terminology associated with plant pathology and its causing agents in the field. Regrettably, only little emphasis is placed on biochemical and molecular factors.

The primary source for update of the entries is the Review of Plant Pathology and the 70,000 abstracts published during 1988 and 1996. The definition of technical terms relies on the guide to the use of terms in plant pathology by the British Society for Plant Pathology.

The diseases are usually listed under the common plant names; cross references, however, are given for their Latin binominals. Common names of plant diseases such as blight or canker are included and listed under the relevant host crop for the convenience of the users. The largest part of pathogen names refers to the fungi, which account for about two thirds of the listed, disease-causing organisms. Roughly 500 fungal genera are included with their respective species, focussing on the economically most important ones. The fungi are described under the name of the teleomorph (when known), however, a cross reference to the anamorphic name is given. The taxonomy is fully updated according to the 8th edition of Ainsworth and Bisby's dictionary of the fungi (Hawksworth & al., 1995). Over 800 viruses, bacteria, mollicutes (mycoplasmatales), nematodes and viroids are briefly described and the corresponding literature data are given. In general, the nomenclature is updated according to the newest bibliographic references. After the introduction, a short user's guide, a bibliographic list of the most important titles, and a list of abbreviations are presented, followed by the main body of the dictionary itself.

The book is filled with a wealth of information. Under the entry *Cladosporium*, for instance, not only the common saprobic species, but also many known pathogens are listed, for a total of 17 species, for which the most important morphological features, their host(s) and disease symptoms, as well as reference to their newest descriptions and bibliographic sources are given. Entries for *Alternaria* spp., *Fusarium* spp., *Phomopsis* spp. and *Phythophthora* spp., only to mention a few examples, are treated in a similar way. I definitely find the literature references invaluable, as the latest "literature summary" dates back to 1987 (Rossman & al., 1987). Mycologists who have to identify pathogenic organisms, will

find the references (mostly to journals not routinely screened by them) very useful. The definitions of the technical terms are in general comprehensive and complete, but exceptions, of course, can be found: For instance, the term "endophyte", now generally considered to be quite important also in plant pathology, is explained in a rather incomplete and confuse way. On the other hand, the endophytic lifestyle of *Apiognomonia errabunda* is reported, thus indicating that even sources other than plant pathological journals were carefully screened by the author. This is clearly a further indication of the high standard of this book. As stated in the introduction, the dictionary mainly deals with infectious diseases of the standing crop, its causal organisms and related terms. Unavoidably, this has led to a rather limited handling of modern methodologies. I was not very happy to find only very few terms referring to molecular biology, one of the most important tools in plant pathology. Whilst I could see short but accurate definitions of terms such as DNA, ELISA, isozyme, and serology, no other molecular biology entries could be found. I would have been glad to see at least the definition of RAPDs, RFLP, or sequencing, as well as their usefulness in plant pathology, to name a few. At least, however, the entry molecular biology refers to further literature. Clearly, the main goal of this book is to provide definitions that are useful to plant pathology whose working activities are mainly in the field and not in the laboratory, but I could imagine that the mention of new methodologies would have been of interest to them as well.

In any case, this dictionary is unique in its kind and completeness and undoubtedly it will be invaluable to all researchers working in applied plant pathology. The layout is pleasant and clear: The headers include the first and last entry of each page, thus facilitating the navigation and the search for particular terms. A good quality binding and a plastic hardcover have been wisely chosen to allow a frequent use. Clearly, this book should be on the bookshelf of all plant pathologist and mycologists working with plant pathogenic organisms. I am afraid, that the comparatively high costs of purchase will scare a large number of people from buying it. All departmental libraries, however, should have at least one copy of it.

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References

Hawksworth, D. L. & al. (1995). Ainsworth & Bisby's dictionary of the fungi. 8th edition.– CAB International, Egham, Surrey, UK.,616pp.

Rossman A. Y. & al. (1987). A literature guide for the identification of plant pathogenic fungi.– APS Press, St. Paul Minnesota, USA, 252pp.

Vasilyeva, L. N. 1998. Fungi, pyrenomycetidae et loculoascomycetidae. Tomus 4, Plantae non vasculares, fungi et bryopsidae orientis extremi rossica.– Nauka, Petropoli, 419pp, 60 figs, (in Russian). ISBN 5-02-026054-1.

The monograph contains 629 descriptions of fungal species, which the author assigns to 186 genera in 28 families of 16 orders of the two subclasses Pyrenomycetidae and Loculoascomycetidae (*sensu* L. Vasilyeva). Thirty species new to science are described, 2 families, 3 subfamilies, one tribe and one order are introduced. The classification of the genera in orders and their respective families has been revised throughout. Fifty-eight new combinations are proposed: fifty-five

refer to species, three to tribes. The author also gives a list of 230 species mentioned in the mycological literature as occurring, but most likely not present in the Russian Far East.

The author follows her own taxonomic concept, which is not completely compatible with the current, general taxonomic views and makes thus the comparison with other taxonomic systems somewhat difficult. According to Dr. Vasilyeva, for instance, the Diatrypales contain the two families Diatrypaceae and Phyllachoraceae. The Diatrypaceae are further divided in seven tribes. The genera *Biscogniauxia* and *Peridoxylon* (*Camarops*) as well as *Melogramma* are surprisingly included in the tribe Diatrypeae. *Biscogniauxia* has three sections, with *Camarops* as a new section erected to include *Biscogniauxia polysperma*. Many genera that are generally considered as belonging to other families are accommodated in the Phyllachoraceae as e.g. *Roussoella, Anthostomella, Paracainiella*, generally placed in the Amphisphaericacae. Given my own research interest, I have obviously focussed my attention on the Xylariaceae. The two tribes proposed within the family are the Xylarieae and Sarcoxyleae trib. nov., the latter containing *Entonaema* and *Thuemenella*. The genus *Nemania* is still included in *Hypoxylon* and *Rosellinia* now contains three sections with the new section Emersa. Several new species are reported for this family from the Far East. The author certainly has developed own concepts on the systematics of ascomycetes that clearly differ from the widely used outline presented in the latest edition of the dictionary of the fungi.

Even if I have so far stressed the rather personal view of the ascomycete systematics by the author of the book, the primary scope of this volume has been achieved in full. In fact I consider the work by Dr. Vasilyeva a pivotal report on the fungal biodiversity in the Russian Far East. The many new taxa described are the result of year-long work and demonstrate that the fungal flora of the Russian Far East with its particular vegetation is still little known. This book is extremely invaluable, as it fills, at least partially, the lack of information on fungal distribution in the Northern latitudes. The presence of keys for orders, their genera and the respective species is also a welcome feature of the book. The fact that the text is written entirely in Russian, except for the Latin names and the descriptions of new taxa (given, as required, in Latin), makes unfortunately its use restricted, in its original form, to only a selected number of western mycologists.

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