Book Reviews

Crous, P. W. (2002). Taxonomy and pathology of *Cylindrocladium* (*Calonectria*) and allied genera. – APS Press, St. Paul, Minnesota, USA. ISBN 0-89054-290-2; 7" × 10", soft-cover; 294 pp; 320 black and white illustrations and photographs. Price: US$ 69.00.

Cylindrocladium spp. are important pathogens in the tropics and subtropics. Pedro Crous has been working since a long time with this genus and it is a pleasure to eventually see a synopsis of the data he and his co-workers gathered over more than a decade. Thirty-nine species of *Cylindrocladium*, eight of *Cylindrocladiella*, three of *Xenocylindrocladium*, three of *Gliocladiopsis*, and one of *Curvicladium*, all with the respective teleomorphs are treated. Three new combinations and three new species are described.

General sections focus on anamorph and holomorph names, on baiting, isolation, identification and storage techniques, the disease cycle, pathogenicity, disease symptoms and control. The author spends a great deal of effort in explaining, discussing and illustrating morphological features and cultural characters used for identification. The literature on *Cylindrocladium* dealing with techniques used for species characterization and phylogenetic analyses is discussed exhaustively. The classical taxonomic part forms the main body of the book. A key to the hypocrealean anamorphic genera with hyaline, cylindrical phialoconidia as well as to the *Cylindrocladium* species is provided. An additional key is presented for 28 *Cylindrocladium* with *Calonectria* teleomorphs. Keys for the other genera are also provided. As the stipe extension and the vesicles are crucial characters for *Cylindrocladium* identification, they are illustrated in the keys. Treatment of species includes accurate descriptions, photographs, line drawings, distribution maps, cultural characteristics, cardinal growth temperatures, disease symptoms, hosts, and a thorough discussion. The book closes with the listing of excluded or doubtful species, reference section, glossary, and index to fungal and general names, hosts and substrate.

This book is addressed to people who have to deal with *Cylindrocladium* diseases. The keys use exclusively morphological features for identification and they should be easy to navigate, provided the cultures produce the teleomorphic state when expected. The quality of the illustrations is good. Most valuable are the information on pathogenicity, disease control, and the guide on how to observe morphological characters. The taxonomic concepts presented take into account the outcome of molecular work carried out on this fungal groups since the last classical monographic treatment more than 8 years ago and integrates also pathological data. Therefore, the elaboration of the species concept can be at best described as a beautiful example of polyphasic taxonomy, a modern, integrated approach for monographic treatments.

As for other books on important fungal pathogens recently published by APS Press, I submit that also Pedro Crous's treatise will become a standard reference on the subject for a long time to come. On the whole, this monograph is an excellent piece of work. Its strength lays without doubt in the coherent presentation of the

known *Cylindrocladium* and closely related species and I wholeheartedly recommend it to everybody having to deal with these fungi.

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Krieglsteiner, G. J. (ed.) (2001). Die Großpilze Baden-Württembergs. Band 3, Ständerpilze: Blätterpilze I. Eugen Ulmer Verlag, Stuttgart. ISBN 3-8001-3536-1; 634 pp; 297 colour pictures, 388 distributions maps. In German. Price: € 51,3.

The third volume of the series „Die Großpilze Baden-Württembergs" deals with the „Nichtblätterpilze mit lamelligen Hymenophor" and with the first part of the gill fungi, in particular the families Hygrophoraceae and Tricholomataceae (fungi with light spore prints). Cyphelloid fungi are discussed in an appendix.

The two previous volumes (Kriegelsteiner, 2000a; 2000b) discuss the Heterobasidiomycetidae and, among the Homobasidiomycetidae, the Corticiaceae s.l., the Polyporales s.l., the Cantharellales, Gasteromycetales, Boletales and Russulales. The census and documentation of the fungi occurring in Baden-Württemberg, South Germany, is a long-term project (Kriegelsteiner & Kaiser, 1996). In fact, two, perhaps three additional volumes of this series are planned and should cover the remaining part of the gill fungi, whereas from volume five onwards the species with dark spore prints will be included. This series presents the results of a substantial part of the cartographic project of the German Society of Mycology (DGfM) which includes species protection programs in Baden-Württemberg. Therefore, the strength of this book lays especially in the presentation of the work carried out in the last century (systematic investigations began during the 90's) by amateurs, specialists, cartographers, ecologist and people working for natural conservation in this and adjacent areas

In the present volume approximately 550 taxa are presented. Great attention is devoted to environmental parameters influencing fungi development. Distribution maps of the individual taxa in Baden-Württemberg are given and the distribution in the rest of the world is often discussed.

In addition to identification keys for genera and species, short but accurate genera descriptions are presented. The authors provide a morphological description of the individual species and discuss the intraspecific variability, indicating also possible confusions with other taxa. A taxonomical discussion is presented for species for which the interpretation in the literature is ambiguous or divergent. Krieglsteiner and colleagues review all the existing mycological information on the region (from early twentieth century onwards) and discuss the degree of vulnerability of the mycota present, with special emphasis on ectomycorrhizal fungi. The work includes good full colour pictures, also of taxa rarely illustrated, such as *Floccularia straminea* and *Omphalina cyanophylla*. It is a pity, however, that scale bars were not included in the pictures.

The section on ecology describes the vegetation types in which the fungal species are collected. Edaphic (soil types, nitrogen and base content, humidity, etc.) and climatic factors, substrata, growth morphology and for some species, the fungal association are described. Information on the carpophore production during the year is also given. No statistical analysis of the data is presented, but the conclusions are supported by several records and from years of experience of the authors and their collaborators.

The section on the fungal distribution in Baden-Württemberg provides information on vertical and horizontal distribution frequency for those species found in more than 7 collecting areas (each one being 6.2 × 5.55 km).

The taxonomic position of the species and the nomenclature problems are not the main topic in this book: The nomenclature is mainly based on Krieglsteiner (1991).

The book outlines the general situation in Baden-Württemberg at the end of 1998. So far 416,000 records, belonging to approximately 4,000 species and reported mainly since 1970 have been collected. At the same time, important ecological and distribution data are presented in the book. This information provides a sound basis for the conservation of fungal species.

In summary, this is an excellent book that ought to be in the library of all mycologists interested in fungal ecology and conservation.

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References

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—— (ed.) (2000b). Die Grosspilze Baden-Württembergs. Band 2, Ständerpilze: Leisten-, Keulen-, Korallen- und Stoppelpilze, Bauchpilze, Röhrlins- und Täublingsartige. Authors: Gminder A., Krieglsteiner G. J, Winterhoff W. Collaborator: Kaiser A. – Eugen Ulmer Verlag, Stuttgart. 620 pp.

Schroers, H.-J. (2001). A monograph of *Bionectria* (Ascomycota, Hypocreales, Bionectriaceae) and its *Clonostachys* anamorphs. – Stud. Mycol. 46: 1–214. ISBN 90-70351-44-7. Price: € 50,00.

This publication is the third in the recent series of Studies in Mycology dealing with the *Hypocreales*. At this time, it is a monograph of *Bionectria* and its anamorphs, saprotrophs or destructive mycoparasites, some of which are used as biocontrol agents of fungal plant pathogens. An introduction outlines the historical and recent classification of teleomorphs and holomorphs and presents generic and species concepts. *Bionectria* is delimited from other genera of the Bionectriaceae on the basis of complex teleomorph morphology, phenotypic characters of anamorphs in pure culture and on the natural substratum, ecology and phylogeny inferred from the large subunit ribosomal DNA (LSU rDNA). Six new subgenera and 44 holomorphic or anamorphic species in *Bionectria/Clonostachys* were distinguished. Relatedness of subgenera and individual species is indicated also by phylogenies inferred from sequences of the internal transcribed spacer regions of the ribosomal DNA (ITS rDNA) and the β-tubulin gene. The phylogenetic trees are shown.

Schroers carefully approached the anamorph question. The plurality of anamorph genera linked to *Bionectria* is taken to recognize naturally related groups of species. Anamorphs of *Bionectria* were classified in *Clonostachys*, a broadly circumscribed genus, where ten anamorph genera were previously included. The phenotypic features of anamorphs and cultural characteristics unite all *Bionectria* species and distinguish clearly the genus from other genera of the Bionectriaceae. According to the author's own words such conclusions was reached after reinterpretation of certain characters, emphasis on character patterns, the consideration of transition series of particular character states, and considerations of their appearance on the natural substratum as well as in pure culture. I am happy to see this approach and unification of anamorph characters in *Bionectria* considering such complexity.

Six dichotomous keys to selected genera of the Hypocreales, genera of the Bionectriaceae and species of *Bionectria/Clonostachys* are given. I welcome two separate keys to species of *Bionectria/Clonostachys* based mainly on characters of the ascomata on one hand and mainly on characters of the anamorph from pure culture on the other. Such keys are important for identification if one of the morphs is missing or characters are not complete. For each species basionym and synonyms are given. This information is followed by detailed description of characters on the natural substratum and in pure culture and line drawings and photographs, both of high quality. A brief discussion follows each species description.

The fungal taxonomy and generic and species concepts proposed by Schroers reflect today's systematics and recent discussions on Art. 59. The monograph of *Bionectria* and its anamorphs now gives taxonomists a good identification tool and guide through this not easy group of microfungi.

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Watanabe, T. (2002). Pictorial atlas of soil and seed fungi: morphologies of cultured fungi and key to species, 2nd edition. – CRC Press LLC, Boca Raton; ISBN 0849311187; hardcover; 486 pp. Price: UK£ 87.00.

Soil and seeds host a rich fungal biodiversity and represent an invaluable source of fungal organisms that may be potentially useful to industry and agriculture. On the other hand, there is never enough literature to identify a fungal species, and the second updated edition of Watanabes' Pictorial Atlas provides a welcome addition to the existing literature.

In this book, over 350 fungal species are described: 46 belong to the mastigomycetes, 33 to the zygomycetes, 36 to the ascomycetes, 8 to the basidiomycetes and 240 to the mitosporic fungi. Compared to the first edition, forty-five additional taxa are recorded as species that are, however, not described formally. Within the various fungal groups, the genera are displayed in alphabetical order, listing their type species and respective publication date. Morphology, dimensions of microscopic characters, material studied, remarks, references, and illustrations are provided for one or several species for each genus.

The general sections at the beginning of the book focus on the topic of studying soil and seed fungi, their relationship with plant pathogenic and root inhabiting fungi, general isolation techniques of such fungi and hints on the identification procedure. Dichotomous keys to genera precede the species list, which represents the main part of the book. Genera represented by several species include a key to the species. An extensive reference list concludes the book. The

appendix includes a useful list of cultured soil fungi with the respective deposit and publication references, and an index to fungal names.

The general sections are carefully elaborated and provide a useful insight in the problems related to the work with soil samples and the isolation of fungi from this habitat. Most welcome is a selected list of soil fungi studied previously from all over the world. Identification characters are listed, however, not illustrated or defined. The identification keys are organized from a practical viewpoint, first leading to the classes, then to the genera applying classical differentiating characters. *Cylindrocarpon*, *Cylindrocladium* and *Fusarium* are keyed out within the sporodochium-forming fungi as well as within the Phialosporae, thus taking into account the variability of fungi in culture. I found odd that *Dematophora* keys out within the synnemata-forming fungi using the character state "synnema not formed", with pear shaped hyphal swellings and no cross-reference is given to this genus within the Sympodulosporae. This may be confusing as, if synnemata are lacking, one would step automatically into the Sympodulosporae. Otherwise the keys are straightforward and transparent. The inclusion of 7 mastigomycetous genera with 34 species of *Pythium* adds to the value of this book, as these fungi are often treated separately.

A strength of the book is the inclusion of line drawings and microphotographs for each taxon treated. In general, their quality is satisfactory despite in some cases the optimal magnification of the photographs imposed by the physical limitations of the compound microscope was exceeded by too much, thus resulting in pictures out of focus, such as those of *Aspergillus* sp. sect. *wentii*, *Aureobasidium pullulans,* or *Trichothecium roseum*. A major omission in the pictures is the lack of scale bars.

The book presents a large amount of work collected systematically over a long period of time. With the second edition of this atlas Dr. Watanabes' shares his experience acquired as plant pathologist and mycologist specialized in soil and similar fungi over a long period of time. I am sure that it will soon become a standard reference in mycological libraries.

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