

Book Review

D. Werner. *Symbiosis of Plants and Microbes*. Chapman & Hall, London, 1992. 389 pp. ISBN 0 412 362309.

This book is the first English language edition of "Pflanzliche und mikrobielle Symbiosen" (1987). In either language the title is misleading: 146 pages are devoted to minutiae of molecular biology of nitrogen fixation; a further 81 pages deal with physiology of mycorrhizas (molecular data still being largely unavailable). The remainder of the book is a surprising *mélange* of bits and pieces from the symbiological literature. Symbiosis is equated with mutualism; plants and microbes are equated with almost anything alive. Sections are devoted to symbioses between diatoms and cyanobacteria, and dinoflagellates and corals. There are surprising entries on "Insects, worms and mussels as hosts" (of bacteria and cyanobacteria), or "Symbioses in the digestive tract of ruminants" (with bacteria, fungi and ciliates). These topics stretch even the traditional boundaries of plants and microbes, and are at odds with Cavalier-Smith's analytical 8-Kingdom system which the author promotes (Table 1.5). Fungi are explicitly referred to "eukaryotic plants" (p. 149).

The coverage of nitrogen fixation is in impressive thoroughness and detail. Problems appear when the author ventures outside the rhizosphere. Symbioses of bryophytes (mosses, hornworts and liverworts) merit less than a page of text, and warrant no entries in the index. References to fungi (e.g., Table 9.2) contain irregularities of spelling, terminology and interpretation.

The text is intended for "undergraduates and graduates" but this too can be questioned. The treatment of nitrogen fixation is much too detailed to be inflicted on a biology undergraduate. Furthermore, no glossary or recapitulations were provided to disarm the formidable battery of jargon.

The English edition is extensively updated. Of the 276 references that follow the chapter on rhizobial symbiosis, 172 are 1987 or more recent. This well illustrates the rate of progress in molecular biology and physiology, which are the focus of this book. It also warns that the useful "shelf-life" of the book may not justify the £60 price tag, especially to a student.

The chief value of the book lies in the exploitation of the long and rich tradition of German symbiological literature, which is increasingly overlooked by obligate anglophones.

The book reads well, despite technical jargon and a generous sprinkling of Latin names. An organismal biologist may feel that the names apply to graphs and diagrams of metabolic pathways rather than to organisms. But all readers will probably agree that the author succeeded in introducing excitement into the quantification of means, even if it is not always clear to what ends.

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