

Waard, M.A. de, Groeneweg, H. & Nistelrooy, J.G.M. van, 1982. Laboratory resistance to fungicides which inhibit ergosterol biosynthesis in *Penicillium italicum*. *Neth. J. Pl. Path.* 88: 99-112.

Book review

E. Kurstak (Ed.), 1982. *Microbial and viral pesticides*. Marcel Dekker AG Publishers, Basel. 720 pp. With tables, illustrations, references at the end of each contribution, 10 pages of general index. Cloth bound. Price SFr. 284.

The problems associated with the wide-spread use of chemical insecticides (environmental pollution, resistance and secondary pests) have stimulated studies on alternative control strategies that are ecologically sound. Although chemical insecticides are essential to maintaining the present level of agricultural production, alternative pest control strategies based on integration of different methods and agents, including the use of microbial and viral pesticides, have received more attention during the last decade. This is due to successful release of some of these biological control agents and the notable progress in basic research at the molecular level. The purpose of this treatise 'Microbial and viral pesticides' is to present a comprehensive review of the literature on practical applications and the safety of microbial and viral agents, and to give an update on recent developments in this area.

In this volume, the editor has brought together 21 chapters from various experts, and divided these chapters among 7 sections. The book is of considerable size (720 pp.) and includes over a thousand references. After a general introduction (section I), the relevant groups of pathogens with pest control potential, i.e. bacteria, viruses, fungi and protozoa, are the subject of the following sections (II through V). A separate section (VI) is devoted to microbial herbicides. The varying size of the different sections reflects the relative potential and importance of these agents in insect and weed control. The book concludes with a section on registration of microbial and viral pesticides (section VII).

In the rather scanty general introduction (section I), the mode of action, safety aspects, and 'future prospects' of microbial and viral pesticides are discussed, and the authors (E. Kurstak
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and P. Tijssen) try to provide a prelude to the following chapters of the book. However, some subjects in this chapter (e.g. on myxomatosis) are not relevant to the remainder of the book, whereas others (e.g. microbial herbicides) go unnoticed. It would have been appropriate here to have included a section on the possible impact of modern molecular biology, e.g. the genetic manipulation of entomopathogens, and on future strategies.

In section II the attention focuses on bacterial pesticides with primary emphasis on *Bacillus thuringiensis* and its use in the control of insects deleterious to agricultural crops as well as arthropod vectors of human and animal diseases. The area is well covered although there is some repetition between the chapters, notably on the mode of action. The detailed and well documented account by R.M. Faust and L.A. Bulla Jr. is the most valuable source of reference to date for those who are interested in the origin and mode of action of bacterial toxins. However, this chapter is not easily digestible for non-experts.

Section III provides information on theoretical and practical aspects of baculovirus application to control insect pests of agricultural importance. In this part, the use of baculoviruses is exemplified by field trial reports on the control of forest, pasture and vegetable crop pests. The chapter by H.F. Evans and P.F. Entwistle is both interesting and valuable in that it documents the multiple factors that influence epizootiologies and persistence of virus in the field. Two chapters focus on the problems related to mass-production of baculoviruses *in vivo* and in cell cultures. A chapter on the nature and mode of action of baculoviruses as well as on general concepts and methodologies of their application could have preceded the more documentary chapters present in this section. Additionally, the use of other viruses (e.g. cytoplasmic polyhedrosis viruses), although not as important as that of baculoviruses, should not have been completely ignored.

Fungi and protozoa have some potential as insect biocontrol agents, but too many variables influence their effectiveness and, therefore, they have not always proven reliable. The four chapters of section IV and V underscore and substantiate this view. Of scientific interest are the mycotoxins that are effective against insects. However, they are impractical considering their adverse effects on vertebrates. The use of plant pathogens (in particular fungi) to control weeds is interesting and innovative (section V), but their implementation in crop protection schemes is just beginning. These chapters provide information which leads one to conclude that the advantages of using these pathogens as pest control agents are not yet clearly obvious.

The treatise ends with an excellent review on regulatory safety data that are required for registration of pesticides (M.H. Rogoff). The author approaches the subject from various perspectives (historical, scientific, analytical and impact) and blends this into a holistic view of the subject.

Like most collections of paper by different authors, this book has its strengths and weaknesses. The quality of the contributions ranges from fair to excellent, the majority being in the latter category. However, some accounts weaken the overall importance of the treatise as they hardly go beyond the authors' own research and lack the perspective on new concepts or developments (chapters 7, 11 and 19). For example, the recent advances in virus identification have not been adequately covered.

In general, this book is well printed and presented, but sparsely illustrated. A minimal number of printing errors is found. As a reference this book should prove quite useful for those experienced in this field and wanting to brush up on certain aspects of microbial and viral pesticides. For students, it could be beneficial provided they have previous knowledge of the subject matter.

In practice, this treatise has to compete with another book on this subject (Microbial control of pests and plant diseases 1970-1980, H.D. Burges, Ed.), which has a wider scope but less depth. Therefore, the number of concise and in-depth reviews justifies the acquisition of 'Microbial and viral pesticides' by specialists and libraries in the area of crop protection. The price may prevent individuals from buying this book.

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