

BOOK REVIEW

REGNAULT-ROGER C., PHILOGÈNE B.J.R. & VINCENT C. (EDS): BIO-PESTICIDES OF PLANT ORIGIN. Intercept Ltd – Lavoisier Publ. Inc., Hampshire, UK, Secaucus, NJ, USA, 313 pp., 2005, ISBN 2-7430-0675-7. Price EUR 100.00, USD 136.00, GBP 71.00.

Thirty four experts from nine countries have written this book, which reports advances in basic and applied research in the field of biopesticides. This multidisciplinary reference book presents an overview of the potential of new crop protection agents of plant origin and their place in integrated pest management (IPM). They represent a way of solving problems such as pest resistance to synthetic pesticides, water contamination and environmental pollution as part of sustainable agriculture, including organic crop production, in developed countries. An important prerequisite for the development and practical application of biopesticides are not only advances in analytical chemistry and molecular biology but also a better understanding of the interactions between plants (allelopathy) and between plants and pests (attractants, repellents and toxins). This knowledge has also led to the discovery of plant resistance genes. Genetic engineering of plants promises to make a substantial impact on plant-parasite relationships.

This book consists of a preface, foreword, list of contributors and 17 chapters that summarize the rich recent literature.

In the first part of the book (Chapter 1 – Chapter 5, written by the editors, J.T. Arnason, T. Durst, and P.-H. Ducrot) there is a short historical outline and brief account of the information on first and second generation insecticidal plant compounds, and the possible use of biopesticides as an essential component of IPM.

The second part: (Chapter 6 – Chapter 15) presents an account of the main groups of plant-derived crop protective compounds.

Chapter 6 – Sulphur compounds derived from *Allium* and Crucifers and their potential use in crop protection (by J. Auger and É. Thibout) focuses on synergistic lignans, sulphur compounds from *Allium*, cruciferous plants and their insecticidal, acaricidal, nematocidal, herbicidal, fungicidal and bactericidal properties.

Chapter 7 – The role of phytoecdysteroids in the control of phytophagous insects (by M. Marion-Poll, L. Dinan and R. Lafont) describes the structure of phytoecdysteroids, their distribution and metabolism in plants and their effect on moulting in phytophagous insects.

Chapter 8 – Idioblast oil cells as a source of new botanical products with biological activity (by C.R. Rodriguez-Saona, J.G. Millar and J.T. Trumble) covers recent advances in the identification of lipophilic materials secreted by oil cells of some Dicotyledons (terpenes, alkaloids, sesquiterpene hydroperoxides) and discusses the chemistry and potential defensive role of idioblast oil from avocado against herbivores.

Chapter 9 – Use of secondary plant products to protect the seeds of a legume, cowpea. Effects on insect pests and their parasitoids (by J. Huignard, S. Dugravot, K.G. Ketoh, É. Thibout and A.I. Glitho) focuses on the effect of secondary compounds such as terpenes, sulphur compounds and alkaloids on bruchids and their parasitoids (Pteromalidae).

Chapter 10 – Allelochemicals: tomorrow's herbicides? (by G. Chiapusio, C. Gallet, J.-F. Dobremez and F. Pellissier) covers recent advances in the research on allelopathy and use of allelochemicals in the formulation of herbicides, and genetic improvement of cultivated plants that naturally synthesize substances with allelopathic potential.

Chapter 11 – The role of phenols in plant defense mechanisms (by C. El Modafar and E.-S. El Boustani) describes the role of various phenolic compounds in physiological processes in plants and their potential role in plant resistance to phytopathogenic microorganisms.

Chapter 12 – Nematicidal and nematode-resistant plants (by C. Djian-Caporalino, G. Bourdy and J.-C. Cayrol) is the longest chapter in the book and presents a very comprehensive discussion of intrinsic resistance of certain plants to parasitic nematodes and its possible use as an efficient, durable and non-polluting method of pest control. The plants protect themselves against nematodes by secreting toxins (nematicidal plant secondary metabolites) and can be used in crop rotations with susceptible plant cultivars.

Chapter 13 – Impact of plant proteins, expressed in transgenic plants, on beneficial insects (parasitoids and pollinators) (by A. Couty, L. Jouanin and M.-H. Pham-Delègue) deals with the impact of entomotoxic proteins produced by genetically modified organisms (e.g. Bt δ -endotoxin and lectins) on beneficial insects.

Chapter 14 – Synthesis of odorant reception-suppressing agents, odorant-binding proteins (OBPs) and chemosensory proteins (CSPs): molecular targets for pest management (by J.-F. Picimbon) focuses on molecular targets for odorant receptor suppression agents. The olfactory system of insects is very sensitive and selective not only for detecting pheromones but also plant odours (olfactory inputs in host plant and sex partner localization). The control of the reception of odours and chemosensation might be an effective way of controlling insect pests and achievable either by gene knock out or by locking the active sites of the protein.

Chapter 15 – Vegetable oils and monoterpenes in agrochemical formulations (by C. Gauvrit and F. Cabanne) contains much new material on vegetable oil (rapeseed oil) and monoterpenes (e.g. from pine oil) as a source of adjuvants or formulants, which are perspective constituents of commercial preparations, because they are readily biodegradable and void of environmental toxicity, are equally effective as mineral-oil-derived products and cost the same.

The third part of the book (Chapter 16 by M.B. Isman and Chapter 17 by A.I. Glitho) focuses on the introduction of a new botanical insecticides and whether they can compete effectively with other crop protection and insect control products, and their use as biopesticides in Africa. The latter chapter, which is labelled as an appendix, is highly appropriate, as it suggests that the greatest opportunity for the application of biopesticides is in Africa.

Biopesticides of Plant Origin is especially designed for researchers, academics, advanced undergraduate and graduate students in science, agronomy and veterinary schools, and decision-makers involved in agricultural development and environmental protection.

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