Insecticides Design Using Advanced Technologies
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With 62 Figures, 9 in Color, and 32 Tables

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Preface

Insecticide development in recent years has been guided mostly by chemorational and biorational design based on understanding of the physiology and ecology of insects and crops. Among the recently developed groups of insecticides are the chitin synthesis inhibitors, benzoylphenyl urea’s and buprofezin; the juvenile hormone mimics, fenoxycarb and pyriproxyfen; the ecdysone agonists, e.g. tebufenozide and methoxyfenozide; and the new neurotoxicants, the neonicotinoids and the avermectins. In addition, compounds affecting specific sites in insects have been developed; such as pymetrozine acting on the sucking pump of aphids and whiteflies, diafenthion affecting insect respiration and azadirachtin the hormonal balance of insects.

A limitation in each new class of compounds is the evolution of resistance in populations of key pests, which leads to control failures. This phenomenon and the desire to produce more selective and biorational compounds serve as the driving forces for insecticide design that ultimately lead to the development of new compounds.

Among the highlights of this book are the use of nanotechnology to increase potency of available insecticides, use of genetic engineering techniques for controlling insect pests, development of novel insecticides that bind to unique biochemical receptors, and exploration of natural products as a source for environmentally acceptable insecticides. In addition, screening for safe and potent insecticides using insect genomics and cell lines for determining biological and biochemical modes of action are discussed in detail in this book.

The authors of the various chapters are considered world leaders having a wealth of experience in pesticide chemistry and in advanced technologies for designing highly selective insecticides for controlling insect pests.

This book is intended to serve as a text for researchers, university professors, graduate students, and chemical industry personnel involved in developing new groups of insecticides to suit our future requirements.

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