
Book Review

Insect Chemical Ecology. Ivan Hrdý (ed.). Prague, Czechoslovakia: Academia Praha, 1991. 513 pp.

This book consists of a compilation of 75 papers presented at a conference in Tábor, Czechoslovakia, in August 1990. The invited speakers had been asked to present either comprehensive or introductory reports and, as a result, the contributions are of variable length and nature, ranging from relatively extensive reviews to brief research communications.

The book is divided into three sections: (1) chemical communication in insects; (2) chemical insect-plant relationships; and (3) prospects of practical application of pheromones and juvenoids.

Section 1 begins with a review of new methodology for pheromone isolation and identification, with examples of structure-activity studies and some discussion of perception mechanisms. This is followed by a report on the use of photoaffinity labeling to characterize receptors and carrier proteins involved in transport and transduction processes. Subsequent papers describe specific examples of pheromone systems, with emphasis on structure-activity relationships, species specificity, control of pheromone production, and factors affecting insect responses. Included in this group is a well-conceived study of the evolution of moth pheromones. Some additional papers deal with more novel types of pheromones produced by social as well as phytophagous insects. Several contributions are devoted to synthetic methods for pheromones and their intermediates, and others are concerned with factors affecting release rates of pheromones, or perception by and subsequent behavior of the target insect.

Section 2 starts with an introductory review of phytoecdysteroids, followed by several more specific studies of ecdysteroids from various natural and synthetic sources. Other contributions deal with plant compounds that affect feeding, reproduction, or orientation. The methodology for analysis, collection, and identification of active phytochemicals is addressed by several authors.

Section 3 provides many examples of efforts to use pheromones or juvenoids in the control of insect pests. A large number of these reports focus on population monitoring or mass trapping, whereas others describe preliminary attempts to control specific insects using various juvenoids. Also included here are studies of formulation for controlled release of active compounds and metabolic investigations to determine the fate of certain juvenoids. The opening presentation in this section gives several convincing examples of promising

research areas and new approaches to the practical development of semiochemicals. A review of insect neuropeptides is also included in this section, and another significant paper addresses structure-activity relationships of juvenoids and anti-juvenile hormone compounds.

The quality of papers, although quite variable, is generally good. The involvement of English-speaking coeditors has undoubtedly been useful in the final editing of manuscripts, although some linguistic errors have nevertheless been overlooked. The research appears to be sound in most cases, and some unique ideas have been presented. Since the majority of contributors are from Eastern European countries, this book has particular value as a vehicle for dissemination of ideas and results that were previously suppressed or had limited distribution due to political barriers. The recruitment of participants from a wide variety of other countries has helped to create a truly international flavor and to provide a balance of contributions from both established scientists and developing young investigators.

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Book Review

Herbivores: Their Interactions with Secondary Plant Metabolites—Volume 1. The Chemical Participants, 2nd ed., G.A. Rosenthal and M.R. Berenbaum (eds.). San Diego: Academic Press, 1991. 468 pp.

The first edition of *Herbivores: Their Interaction with Secondary Plant Metabolites*, edited by G.A. Rosenthal and D.H. Janzen, played a major role in providing a conceptual framework for studying the chemical ecology of plant-herbivore interactions. In 1979, when the first edition was published, the study of plant-herbivore interactions was in a very rapid stage of growth and change, and it was inevitable that *Herbivores* would be out of date very quickly. The appearance of a revision has been awaited with great impatience and with high expectations. At last the second edition is out, and it meets all of the expectations that have been held out for it.

The second edition is a two-volume set, with the first volume, *The Chemical Participants*, corresponding to Part II of the first edition. Volume I contains 468 pages divided into 12 chapters, which compares with 349 pages divided into 12 chapters in Part II of the original edition. The chapter titles in the second edition are: Nonprotein Amino Acids as Protective Allelochemicals (G.A. Rosenthal), Cyanide and Cyanogenic Glycosides (D.S. Siegler), Alkaloids (T. Hartmann), Glucosinolates (S. Louda and S. Mole), Terpenoids (J. Gershenzon and R. Croteau), Coumarins (M.R. Berenbaum), Cardenolide-Mediated Interactions between Plants and Herbivores (S.B. Malcolm), Iridoid Glycosides (M.D. Bowers), Lectins (I.E. Liener), Tannins and Lignins (A.E. Hagerman and L.G. Butler), Flavonoid Pigments (J.B. Harborne), and Insect Hormones and Antihormones in Plants (W.S. Bowers).

The second edition is a brand new book; it is not a mere update of the first edition. Of the 15 contributors to the second edition, only four had chapters in the first. Of the nine topics covered in both editions, seven are discussed by different authors in the second edition. The second edition includes three chapters devoted to topics (coumarins, cardenolides, and iridoid glycosides) not covered in the first edition. The three topics not revisited in the new edition are toxic seed lipids, saponins, and proteinase inhibitors.

The quality of the individual chapters is uniformly high. Each chapter provides references for isolation and assay procedures, a review of the occurrence and natural distribution of the particular class of chemicals under consideration, and an excellent description of definitive studies of the role of the

chemicals in plant–herbivore systems. A cursory scan of the bibliographies at the end of each chapter turned up numerous references to articles published in 1989 and 1990, and even a handful from 1991. The structure and style of the second edition, combined with the current state of development of the fields of chemical ecology and plant–herbivore interactions, suggest that obsolescence will not overtake the second edition as rapidly as it did the first.

Clearly, the thrust of this review is that I consider *Herbivores—Volume I. The Chemical Participants* to be an excellent and important book. In trying to construct statements that reflect my judgment that this revision has been a highly successful endeavor, I repeatedly found myself trying to take statements from the Preface and reword them so that I would not be guilty of outright plagiarism. I finally gave up; I simply cannot improve on the review that the editors have written of their own book. I will, therefore, conclude this review by fully endorsing the following comments from the Preface: “This new edition is richer in basic methodology and far more effective in assisting the interested reader who would like to bring the study of plant allelochemicals into their research activities. . . . The second edition focuses sharply on the kinds of important ecological and chemical ecology questions that have been addressed by the study of these compounds and provides insights into current research directions. . . . The second edition is offered because the time has come for an in-depth, updated consideration of how allelochemicals color and shape the many fascinating interactions between plants and herbivores.”

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