

BOOK REVIEW

METCALF, R. L. AND E. R. METCALF. 1992. *Plant Kairomones in Insect Ecology and Control*. Routledge, Chapman & Hall Inc., New York, ix + 168 p. ISBN 0-412-01991-4, hardcover, \$35.00.

This book represents the first in a planned series of entomological monographs entitled "Contemporary Topics in Entomology". While the content of this first monograph is very good (not unexpected given the 40 years of research conducted by Robert and Esther Metcalf in this area of entomology), the editing and proofing were not. The first chapter is rife with typographical, punctuation and spelling errors and incorrect, missing or inconsistent references. Another flaw is that figures are inconsistent in form, most being nicely done while some appeared to have been printed on dot-matrix printers. Sadly, this first chapter sets the tone for the rest of the book. It is a shame that the book was not better edited. While it was difficult to overlook the, perhaps "cosmetic", flaws of this book and evaluate its content, I have tried to do so.

This book is divided into six chapters. The first chapter entitled "Chemical Ecology of Plant Kairomones" is a good introduction to the subject for advanced undergraduates and beginning graduate students. There are a few errors (e.g., stating that "excitants" and "arrestants" induce chemotactic rather than chemokinetic responses in insects) but, for the most part, it is informative and sets the stage for the rest of the book. The first chapter deals well with host selection, volatile and contact plant kairomones and contains a useful table listing and providing references for plant chemicals that have been shown definitively to influence host plant attraction and selection by insects. The authors mention the synthesis and release of volatile and contact kairomones. They then describe the detection and perception of plant kairomones by insects and the behaviors initiated upon perception.

The second chapter deals with the theory behind the use of volatile kairomones as lures for insects. The section on the calculation of active space of semiochemical plumes, behavioral thresholds and release rates is muddled and I lack confidence in the equations because, throughout the chapter, wind speed is used rather than the required average wind speed. A good and simple treatment of parakairomones (synthetic analogues of naturally occurring semiochemicals) and trap design and placement considerations is presented.

Chapter 3 describes the use of kairomones in the management of the Japanese beetle, one of the first insects for which a plant-produced kairomone was patented. The chapter nicely summarizes the life history of the beetle, its host plants and their volatile constituents. The authors discuss the formulation of lures and the use of parakairomones in monitoring and suppression of this important pest insect.

The next two chapters are the real strength of this monologue as they deal with the life work of the Metcalfs. Chapter 4 is a review of their research on the diabroticine beetles and the plant kairomones that influence their behavior. The coevolutionary association of these beetles with the Cucurbitaceae is lucidly presented and the importance of plant kairomones in host selection and host utilization is well described. They describe their research indicating cucurbitacins as feeding stimulants, arrestants and allomones for Diabroticines. They also describe their and others' work on the volatile kairomones released from cucurbit blossoms. They discuss the formulation of lures and baits, the synthesis and use of parakairomones and, finally, the sites and characteristics of diabroticine sensory receptors.

Chapter 5 deals with the chemical ecology of the tephritid fruit flies. The first portion addresses the Ceratininae - their life history, attractants and parakairomones. The second section deals with the Dacinae fruit flies and field evaluation of kairomones

and parakairomones. They added a small section describing the work of Prokopy and others on the *Rhagoletis* fruit flies.

The last chapter is an orphan in this book and does not reflect the title of the book. It deals with pollinators and plant-produced synomones (chemicals associated with an organism that benefit both that organism and the receiving organism). They illustrate these ecological interactions using the well-studied examples of Mediterranean and neotropical orchids and their specific pollinating bees. They do not suggest any uses of synomones in insect control despite the recent research indicating that parasitoid behavior may be manipulated using synomones. It is not clear why this last chapter was added. The topic is ecologically important and highly interesting but this is not the Metcalfs' field of research.

In conclusion, I have used, and will continue to use, portions of this text when teaching my Chemical Ecology course. However, I hesitate to say that it is a "must buy" for my students or for chemical ecologists who are familiar with this literature and can easily access the original publications. This book would be useful, however, for entomologists who are intrigued by the idea of using plant kairomones for insect control and want a good introduction to the subject using examples of successful applications.

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