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Specialization, Speciation, and Radiation—The Evolutionary Biology of Herbivorous Insects

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TILMON, KELLEY J. (Ed.) 2008. Specialization, Speciation, and Radiation—The Evolutionary Biology of Herbivorous Insects. University of California Press, Berkeley. 789 pp. ISBN 978-0-520-25132-8. $65.00 Hardcover.

This book, dedicated to Tom Wood and his work on ecology of the treehopper complex surrounding *Enchenopa binotata* (Membracidae), is divided into 3 sections. Section 1 subtitled 'Evolution of Populations and Species' comprises 10 chapters. Various authors describe speciation mechanisms related to host plant chemistry, host shifts, differences in host plant phenology, hybridization, phenotypic plasticity of both hosts and herbivorous insects, and insect behavior and communication. In various ways these ecological adaptations can lead to assortative mating and possible speciation. In the last chapter in the first section, entitled 'Sympatric Speciation: Norm or Exception?' Douglas J. Futuyma cautions that the evidence for sympatric speciation is not always compelling, but he acknowledges that several cases discussed in the preceding chapters do make it likely that sympatric speciation has occurred in some phytophagous insects, as well as in some non-insect groups.

Section II is entitled 'Co-and Macroevolutionary Radiation'. Authors of these 8 chapters have focused on such topics as island ecology and speciation, the role of pollination and herbivory on plant evolution, ecological and phylogenetic constrains on adaptive radiation, how insect diversification may lead to diversification of natural enemies, and how diversification in plants (for example, figs) can give rise to diversification in insects and their associated parasitoids. This section ends with a summary chapter in which the authors review the phylogenetic relationships that have led to diversification of host plants and the insects that feed upon them. One conclusion of the authors is that insect shifts to different plant families have been very conservative speciation events.

Authors in Section III entitled 'Evolutionary Aspects of Pests, Invasive Species, and the Environment' explore the role of humans in altering the environment, and hence altering plant-insect interactions. Topics include the use of transgenic plants, introduction of exotic plants and exotic insects, including introduction of natural enemies for plant control, global warming, habitat destruction and fragmentation, and other more subtle ways that humans are altering insect and plant communities. The last chapter ends with a plea for entomologist, ecologist, and indeed all of us, to conserve plants and herbivores, and to "avoid unnecessary and potentially dangerous alteration of interactions and foreclosure of evolutionary and coevolutionary options…"

There are many citations to the literature in the text, and complete references at the end of each chapter. Those references will be very valuable to graduate students entering the field, or anyone who needs to research a particular topic. I can highly recommend the book as an excellent resource and a good 'read' to conservation biologists, entomologists, and plant biologists.

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