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BOOK REVIEW

MOPPER S. & STRAUSS S.Y. (eds): GENETIC STRUCTURE AND LOCAL ADAPTATION IN NATURAL INSECT POPULATIONS. EFFECTS OF ECOLOGY, LIFE HISTORY AND BEHAVIOR. Chapman & Hall, New York, 1997, 368 pp., ISBN 0-412-08031-1. Price USD 84.95.

This book summarizes recent studies investigating the genetic structure in natural phytophagous insect populations with an accent given to local adaptation. These organisms provide an excellent opportunity for evolutionary studies – do not form large, panmictic groups, but instead many of them are subdivided into semi-isolated demes, and this status can promote sympatric speciation. The main goal of this book is to provide some insights into the underlying mechanisms and evolutionary implications of population genetic heterogeneity from intrademic to host-race spatial patterns.

The volume contains sixteen chapters equally distributed into four parts, each of them focusing on different approach to the topic. Part I – "Local adaptation: Empirical evidence from case studies" presents tests of local adaptation in natural insect populations. The first chapters investigate deme formation and population structure of scale insects and a dispersive gall-forming midge, the last chapter reviews experiments undertaken in order to elucidate the role of local adaptation in specialized herbivores in deme formation. Part II – "Foundation of local adaptation: The genetic basis of host-plant use and nature of selection" discusses the mechanisms producing adaptive genetic structure, such as host-plant chemicals, maternal and paternal effects, stochastic events and intraspecific variation in host-plant quality. Part III – "Life history, behavior, and genetic structure" describes how the inter- and intra- population genetic variability is affected by natural selection, social behavior, dispersal and life-history strategies. Part IV – "Local adaptation, host-race formation, and speciation" combines theoretical and empirical approaches to understand the mechanisms forming genetic structure and adaptation in various levels – it contains models of differential adaptation and insect-hostplant coevolution, scale-dependent evolution of specialization, gene flow between the host races and sympatric host-race formation and speciation.

The presented book is a unique source of the latest information (some of the results are published here for the first time) not only for students, but also for all researchers interested in population genetics, ecology and evolution as well as entomologists. Besides their ecological and evolutionary importance, insect herbivores can be serious pests and efficient measurements against them can be done only if we have a deep understanding of their natural history, including population genetic properties – and this valuable work enables us to obtain that.

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