MANSON, R. H., HERNÁNDEZ-ORTIZ, V., GALLINA, S., AND MEHLTRETER, K. (EDS.) 2008. Agroecosistemas cafetaleros de Veracruz: biodiversidad, manejo y conservación. Instituto de Ecología A.C. (INECOL) and Instituto Nacional de Ecología (INE-SEMARNAT), Mexico. 348 pp. ISBN 970-709-112-6, paperback, 210 × 279 mm. The book may be ordered from Ave Optica (a company, www.aveoptica.com), contact: Robert John Straub, Avenida Rafael Murillo Vidal 149-201, Fracc. Ensueño, 91060 Xalapa, Ver., Mexico (or email: aveoptica@yahoo.com), and paid for by debit or credit card at US $25.00 plus $25.00 post (by post office) or $27.00 (by courier company).

Mesophyll mountain forest occupies only 1% of the land area of Mexico but contains more than 10% of all the plant and animal species. In the state of Veracruz, coffee cultivation uses part of the geographic area that is or was mountain forest. Traditionally grown at 600-1,400 m under the shade of tall forest trees, coffee trees are coming under management systems that call for greater input of agrochemicals, or for cutting of the shade trees to allow denser plantations of new sun-tolerant coffee varieties. Some growers have converted their land to other uses when coffee did not provide enough profit. The chapters in this book examine the biodiversity of 13 taxonomic groups of organisms on coffee farms in the Sierra Madre Oriental of central Veracruz. Intensive field studies were made in Mar 2004-Feb 2005 under the auspices of "Proyecto Biocafé" mainly by personnel of Mexico's Instituto de Ecología near Xalapa in Veracruz.

The coffee farms were classified into a progression from **rustic** (in which coffee trees are interspersed among naturally-occurring shade trees and there is only a little management by pruning), through **traditional polyculture** (in which fruit trees are interspersed and fertilizers are used annually), **commercial polyculture** (in which naturally-occurring forest trees are replaced by selected shade and fruit trees, and there is considerable use of chemicals and labor), **monoculture in shade** (using planted shade trees, often of a single species, and regulation of the amount of shade, phytosanitary management and much use of agrochemicals), and **sun-grown coffee** trees without shade and with reliance on input of agrochemicals. **Forest fragments** (without coffee trees) were used as representative of the natural condition. Thus, there were six levels.

The taxonomic groups considered were shade trees, bromeliads, orchids, Diptera, Formicidae, Coleoptera, amphibians, reptiles, birds, small and medium mammals, bats, and fungi. Diverse collecting methods were used, but insects were collected mainly in traps. All specimens except Diptera and Coleoptera were identified to the level of species and their names are listed; Diptera were identified to the level of family, whose names are listed; Coleoptera were recognized to "morphospecies", and placed within families whose names are listed.

Chapter 7 by V. Hernández-Ortiz and J. F. Dzul-Caich reported specimens of 38 families of Diptera collected, with 28 families (119,294 specimens) from or near ground level, and 36 families (20,463 specimens) in the canopy. The dipteran fauna from the canopy showed a similarity gradient matching the complexity of the shade structure. In contrast, the fauna observed near the ground did not relate to the shade structure. Chapter 8 by J. Valenzuela-González, L. Quiroz-Robledo, and D. L. Martínez-Tlapa reported 106 species of Formicidae. Species richness and diversity increased with greater complexity of arboreal structure, but abundance decreased. Chapter 9 by C. Deloya and M. M. Ordóñez-Resendiz reported 59,402 specimens, belonging to 61 families of Coleoptera with ≈626 species. Beetles from the soil were the most abundant (57,052 specimens) and most diverse (50 families); abundance (2,139 specimens) and diversity (46 families) in the understory were lower; abundance (218 specimens) and diversity (24 families) in the canopy were still less. For the soil fauna and the canopy fauna, the greatest beetle family richness was on farms with rustic management, and for the beetle canopy fauna those rustic farms had the second highest family richness. It is likely that substantial numbers of the Coleoptera and Diptera belong to species that have not yet been described; whether these descriptions can be completed even within the next decade depends upon how much taxonomic expertise can be focused on them, but such effort is undoubtedly not something that will be funded by "Proyecto Biocafé." Again and again this problem of incomplete taxonomic knowledge is encountered in ecological studies in the Neotropics.

Similar works were performed with the other taxonomic groups. They resulted in the selection of 34 bioindicator species and 50 detector species (Appendix 20.1), all of which had to be named species so excluded Coleoptera and Diptera, but included 25 ant species. Chapter 21 gives the overall conclusions of the study in terms of effect of styles of management of coffee farms on biodiversity, what could be done in terms of management of coffee farms to promote biodiversity, a complex subject involving the necessary profit for the farmers, management of pests and soil fertility, production of certified "organic" coffee, and carbon sequestration.

A further entomological aspect included is pollination of coffee flowers (Chapter 18 by C. Vergara, J. Contreras, R. Ferrari, and J. Paredes). It identified and counted insect visitors to flowers

and experimented with exclusion of insects by bagging flowers. It concludes that on the two rustic farms, and one unshaded and one monoculture farm studied, natural levels of pollination (i.e., by insects other than managed colonies of *Apis mellifera*) were inadequate even though they were a little higher on the rustic farms.

The book is written in Spanish, each chapter with a Spanish resumen and English abstract. It has a nine-page subject index followed by 15 plates each with three to seven color photographs mostly with habitus views of organisms but with some environmental views.

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