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BOOK REVIEW

Identification and Geographical Distribution of the Mosquitoes of North America, North of Mexico

R. F. Darsie and R. A. Ward

University of Florida Press, Gainesville, FL, 2005

383 pp., \$75.00 (hardback)

ISBN 0-8130-274-5

ALTHOUGH MUCH OF THIS edition is a verbatim rehash of the first edition (1980), some very important changes have been made to Darsie and Ward's book that make it a valuable resource. This book is the only book that incorporates many of the recent changes in nomenclature, new species listings, and updates of geographical distributions of North American mosquitoes. Twelve species have been added to the book since the first edition. Changes to the text were necessary because of new species (e.g. *Aedes albopictus* and *Ochlerotatus japonicus japonicus*) invading different parts of North America (Sprenger and Wuithiranyagoon 1986, Peyton et al. 1999), new species being defined (e.g., the detection and naming of the sibling species of *Anopheles quadrimaculatus*) (Reinert et al 1997), and reinstating the subgenus *Ochlerotatus* to genus status (Reinert 2000). Other significant changes are revised and completely illustrated keys for the adult females and fourth instars, new user friendly geographical distribution maps for each species, and an updated systematic index table (Table 1), which includes the new species in North America.

This book is the collective product of two very competent scientists. Each has an excellent publication record and reputation in the field of mosquito systematics. The junior author is a retired medical entomologist from the Walter Reed Army Institute of research, Washington, DC. He is also a former editor of the Journal of the American Mosquito Control Association. The senior author remains active as a research entomologist at the Florida Medical Entomology Laboratory (FMEL), Vero Beach, FL. In addition to his active systematics research, he continues to teach classes in mosquito identification at FMEL and at the annual Dodd Short Courses sponsored by the Florida Mosquito Control Association. Mosquito control professionals from all over the country regularly enroll in these classes. This book serves as a cornerstone in those identification courses. In a recent article in the *St. Petersburg Times*, Jeff Klinkenberg stated that, "What the late Roger Tory Peterson was to birds, the imperial Richard F. Darsie, Jr., Ph.D., is to mosquitoes."

The book is organized into 16 sections and starts with a fairly comprehensive Table of Contents, which makes finding information on the included taxa easy. Next, the authors include the preface from the first edition, which is appropriate because much of the information presented is relevant to the second edition. This preface is followed by a brief preface to the second edition, which mainly acknowledges the support (financial, graphic, and office and laboratory space) that the authors received to complete this

book. Next is a one-page section on the Abbreviations of the states in the United States of America and the Provinces of Canada. This section is followed by a very brief introduction, with the main changes from the first edition being an emphasis on the use of Taxonomists' Glossary of Mosquito Anatomy (Harbach and Knight 1980) for morphological terms, and the fact that at the time of their revising the text there were 174 known species and subspecies in 14 genera and 29 subgenera in the geographic region. This introduction is followed by the systematics section, which was interesting because it discusses the most important taxonomic changes made since the last edition. It includes lists and discussions of new species, species resurrected from synonymy, and exotic species introduced into the United States and Canada. It also provides the reader with a better understanding of the authors' positions on the included taxa. Next are sections on the morphology of adult females and fourth instars, which are followed by generic keys to the adult females and fourth instars. Immediately after these generic keys are keys to the species of each genus. All characters used in the keys are illustrated by well done, original drawings (1,045) inserted between key couplets. Keys are included for the identification of all 174 mosquito species and subspecies known to occur in North America, north of Mexico. As expected, these keys make up nearly half the book.

The sections on adult and larval morphology discuss the anatomical structures mentioned in the keys. Other than moving the selected bibliography of mosquito morphology to the back of the book, the adult morphology section is basically unchanged from the first edition. The larval morphology section has at least one confusing change of note. In describing the setae of segment X, in the first edition the authors' state that the most posterior seta is designated as 4a-X; then proceeding anteriorly, they are 4b-, 4c-, 4d-X, etc. In the second edition, referring to the same figure they seemingly state just the opposite, i.e., that the most anterior seta is designated designated as 4a-X; proceeding posteriorly the setae are then 4b-, 4c-, 4d-X, etc. At best this is confusing; at worst a contradiction. Another apparent contradiction between the first and second editions for larval morphology is the number of pairs of setae on abdominal segments I-VII (97 versus 86). Both the adult and larval morphology discussions are followed by a series of very useful full-page plates illustrating key morphological characters.

Next is a section on the geographical distribution of the Culicidae of the United States and Canada. This information is provided in text, tabular, and figure form. The second edition includes a vastly improved 134 mosquito species distribution maps compared with 41 in the first edition. Instead of having overlapping distributions of multiple species on each map that were hard to distinguish, this edition has a separate map for most important species.

The next section is the selected bibliography of mosquito morphology that contains important refer-

ences to understand mosquito morphological terminology. This section is followed by the greatly expanded section on the bibliography of mosquito taxonomy and geographical distribution (815 versus 536 references) over the first edition. Next is an appendix that contains the locality data for the mosquito specimens used to prepare the illustrations for the keys. Then, there is a very useful index to scientific names, which provides an easy way to find information on specific taxa. This index also provides useful information (in bold) to locate the appropriate geographic distribution map for each species.

This book does contain a number of technical errors. Recently, an errata sheet, containing approximately 40 errors, was posted on the FMEL Web site under "Downloads" on the opening page at <http://fmel.ifas.ufl.edu/errata.htm>.

Who should buy this book? When asked this question in that recent newspaper interview with Jeff Klinkenberg, Dr. Darsie responded, "Every mosquito control district in the United States should have this book, every agency that has any dealings with mosquitoes, and every university library that has an entomology department should have this book." I agree. It is a valuable resource for anyone interested in learning about the basics of mosquito morphology and identification, this includes mosquito control personnel, beginning and advanced students, and professional medical entomologists. As stated above, it is the

only comprehensive, relatively up to date book on the identification and geographic distribution of mosquitoes in North America, north of Mexico.

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