BOOK REVIEWS

KEYS TO THE ADULTS, MALE HYPOPYGIA, FOURTH-INSTAR LARVAE AND PUPAE OF THE BRITISH MOSQUITOES (CULICIDAE). P. S. Cranston, C. D. Ramsdale, K. R. Snow and G. B. White. 1987. Freshwater Biological Association Publication No. 48, Ambleside, Cumbria, U.K., 152 pp. £9.

This is a commendable treatment of the 32 species of mosquitoes known to occur in Great Britain (England, Northern Ireland, Scotland and Wales). It includes a checklist of 6 genera, 13 subgenera and 32 species. Added are the synonyms of each species, general mosquito biology, methods of collection and preservation, methods of identification, which contain the morphology of the 4 stages, followed by the keys which are sufficiently illustrated to ably assist the user.

Keys to the adult females, adult males, male hypopygia, fourth-instar larvae and pupae are in the publication. The authors deserve much credit for including the nongenitalic keys to adult males and pupae, for these are not usually a part of such a work. Material for all species of all stages was available for use in formulating the keys, except the pupae of four species. Had the authors consulted Cornell Memoir 304, p. 25, 1951, they would have found a description of one of the four, *Aedes sticticus*; likewise the pupa of *Culiseta fumipennis* was described in the Bull. Soc. Sci. Nat. Tunis 7:27, 1954.

The final section deals with the ecology, physiology, behavior and distribution. It is noteworthy for its thoroughness. For me it was quite edifying.

One apparent oversight was the omission of the "Taxonomists' Glossary of Mosquito Anatomy" by Harbach and Knight (1980). It is not even mentioned in the reference section, which is otherwise very thorough with 195 citations. The authors were hoping the glossary would lead to standardizing morphological nomenclature.

The publication contains certain anomalies which should be pointed out. There are many examples where the Harbach and Knight terminology was not used, e.g., pecten teeth for pecten spines, spiracular for prespiracular, tergite for tergum.

Adult Female: The illustrations of the scuta in Figs. 23a and 24a are reversed. Fig. 24a should be *Aedes dorsalis* while Fig. 23a, *Ae. caspius*. Apparently, Figs. 23b and 24b are also reversed.

In couplet 18, page 37, the abdomen of *Culex territans* is described as having transverse apical bands. I have seen many specimens in the USA in which the bands are not complete. Only apicolateral pale patches are present. Could this also be true in the UK?

Fourth-Instar Larva: The definition of siphonal index does not indicate where the width measurement is to be made. Some authors use the middle of the siphon, others, the basal width.

Fig. 7a is used as the illustration for the lateral saddle seta (1-X), but it is not labeled as such; however, it is labeled in Fig. 3c, so it should have been referenced for showing seta 1-X.

In couplet 15, page 74, the authors could have used the setal character, setae 5,6 and 7-C in a straight line, instead of the hard-to-see mouth brush filaments.

Figures 90 and 92 of the heads of *Aedes communis* and *Ae. sticticus* are reversed.

Pupa: Absolute measurements as mentioned in couplet 20, page 96, may not apply to all specimens since size in mosquitoes is temperature dependent.

Ecology, Physiology, Behavior and Distribution: *Aedes cinereus* was reported as occurring "throughout North America," but it is absent from Mexico and Central America.

It is stated, "In the latter instance, *molestus* was in company with typical *Cx. pipiens*." One has to wonder how these forms were distinguished when the keys report them inseparable in all stages.

The authors failed to note that *Culiseta morsitans* is also found in northern North America where it acts as a secondary vector of Eastern equine encephalitis (Morris et al. 1973. Am. Jour. Trop. Med. Hyg. 22:561).

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MOSQUITO CONTROL TO FIT YOUR TOWN. Robert D. Sjogren with M. Michele Genereux. 1987. Zoecon Industries, 12200 Denton Drive, Dallas, TX 75234. 119 pp. $14.95.

This publication is designed to furnish help in the establishment of mosquito control programs in areas where no formal abatement operations exist, yet mosquito problems occur. It is suggested that planning may consume a year; "Research Tasks in the Planning Year" are de-

tailed. Chapter II (15 pages) is devoted to definition of the mosquito problem. The program manager should try to ascertain the human tolerance level for mosquitoes, the economic impact and health risks. Information on conduct of surveys and analysis of data is provided. Chapter III is entitled "Identifying Local Mosquito Species" or "Identifying Local Mosquito Sites." It is recommended that monitoring of adult mosquito activity be initiated one year before implementation of control work, preferably in the spring of the year. Preparation and use of maps is described. Explanations are given of how to select collection sites and how to collect and evaluate mosquito samples. Keys for identification are not included, but a table lists 18 species with data on regional distribution, breeding grounds, flight range and other behavioral characteristics. Californians may feel slighted because one or two of their worst pests are omitted, *Psorophora "confinnis"* should have been "*columbiae.*" Chapter IV is entitled "Stalking the Mosquito Sites." Helpful suggestions are made emphasizing habitat characteristics, environmental and ecological conditions, dispersal patterns of involved species, mapping and selection of sites for collection of larvae. An interesting discussion of "Site Annoyance Potential" is followed by tables with data from hypothetical sectors.

Chapter V, "Interim Data Review," consists largely of a series of questions which need to be answered as progress is made toward selection of control methods. In Chapter VI, "Choosing the Best Control Option," discussions concern localized adulticiding, adulticiding in localized areas and in mosquito harborage areas, adulticiding in localized areas with larval control in town, larval control of all sites within the flight range of mosquitoes which occur inside the control zone, physical and biological mosquito control and emergency mosquito vector control. Tables give useful details about insecticides used against adults, 8 materials used against larvae and data on costs and efficacy. The final chapter "Putting the Program into Place" emphasizes the importance of planning and cautions against yielding to pressures for immediate action such as using chemicals without knowing whether mosquitoes are present. With appropriate planning as described in this book, the administrator of an incipient program will have all necessary information for budget justification and for making the right decisions relative to methods of operation. Managers of established programs will benefit from reading this book. All of the information presented is not applicable everywhere, but there are many valuable ideas which need to be widely disseminated. Unaccountably, the American Mosquito Control Association and its publications are not mentioned.

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CENTRE FOR RESEARCH IN MEDICAL ENTOMOLOGY, MADURAI, ANNUAL REPORT 1987–88. Indian Council of Medical Research, New Delhi. 96+ pp.

Approximately one-fourth of this report concerns research on Japanese encephalitis with emphasis on sentinel animal studies, monitoring mosquito densities, identification of blood meals and serological surveillance of virus activity. Cases of JE occurred in localities near rice fields where pig populations were relatively high. Thirty pages are devoted to control studies. Neem cake powder in paddy fields caused a reduction in mosquito populations and an increase in grain yields. Water fern suppresses mosquito populations but is not highly effective. *Bacillus sphaericus* is effective but not practical.

Faunistic surveys are described in 13 pages. A new species of *Aedes (Diceromyia) nummatus* group is mentioned. Miscellaneous items are discussed in the last 11 pages. Sixteen publications are listed, and there are 4 pictures in color. Opposite the list of staff members there is a statement that permission of the director, R. Reuben, should be obtained prior to citation of the report.

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