

BOOK REVIEW

LANCASTER J. & BRIERS R.A. (eds) 2008: AQUATIC INSECTS: CHALLENGES TO POPULATIONS. Proceedings of the Royal Entomological Society's 24th symposium. CAB International, Wallingford, UK, x + 332 pp. ISBN 978-1-84593-396-8. Price GBP 85.00, USD 170.00, EUR 135.00.

Aquatic insects are an important part of the freshwater biota. They exhibit a wide variety of morphological, behavioural and life-history adaptations to the aquatic environment. This allowed them to colonize a broad range of aquatic habitat spanning small and ephemeral water bodies formed in bases of plant leaves to the vast expanses of the ocean surface.

This amazing diversity of aquatic insects contrasts with the relatively few books published on their ecology and evolution over the last two decades, with only 2008 exceptional, when three books were published. Each of them fills a different niche and will have a different readership. The *Dragonflies and Damselflies: Model Organisms for Ecological and Evolutionary Research* edited by A. Córdoba-Aguilar deals with only one order of the aquatic insects, the Odonata. The 4th edition of the *Introduction to the Aquatic Insects of North America* edited by R.W. Merritt, K.W. Cummins and M.B. Berg is primarily a textbook aimed at North American students and researchers. The third book, *Aquatic Insects: Challenges to Populations* edited by J. Lancaster and R.A. Briers, is perhaps closest to an update of the ageing, 1984 classic, *The Ecology of Aquatic Insects* edited by Vincent Resh and David Rosenberg.

The book *Aquatic Insects: Challenges to Populations*, was conceived at the 24th International Symposium of the Royal Entomological Society in Edinburgh in July 2007, where the 15 chapters written by 25 authors were presented. Emphasis is on population-level processes, although many contributions view the challenges to insect populations in terms of the individual and its physiology. The topics cover major questions from adaptations to adverse abiotic conditions (low temperatures, high salinity, droughts and floods) and movement and dispersal of aquatic insects within and between habitats to genetic structure of populations and macro-ecological and macro-evolutionary patterns in aquatic insects. Several chapters also cover "mainstream" ecological questions such as host-parasite interactions in aquatic insects (written by S.L. Kohler) or the effect of cannibalism on the population dynamics of larval dragonflies (F. Johansson and P.H. Crowley). All chapters give detailed, often

in-depth material on the subject and provide excellent starting points for interested readers.

The writing varies from standard reviews of well-established fields, such as the chapters on adaptations to winter conditions (H.V. Danks) and saline water (T.J. Bradley), to more conceptual or speculative chapters in areas where progress has been hampered by methodological difficulties (such as the study of movement and dispersion of insects in stream channels, J. Lancaster). One chapter even presents a clear take-home message on how to lower one's impact on aquatic insect populations: buy a white car and do not have your grave stone polished! This is because many aquatic insects mistake the surfaces of red and black cars and shiny flat stones for water due to their polarization vision (chapter by G. Horváth and G. Kriska).

Overall, the book leans more towards running water systems (seven of the 15 chapters deal exclusively with stream insects), reflecting the areas of expertise of the individual authors and editors. This is not a criticism but rather a reflection of the status quo in aquatic insect science: communities in standing waters have been less frequently studied until recently, and emphasis there has been more on conservation issues, even if those studies are mostly descriptive or correlational. It is also a pity (and an outstanding challenge for aquatic entomology!) that we lack detailed case studies shedding more light on the links between the basic science presented in this book and real-world applications. More synthetic studies and studies combining field and laboratory research with theoretical and mathematical models are also much needed. In the book, they are represented by a model of population responses of drifting stream invertebrates to environmental variability by S. Diehl and his co-workers and by the closing chapter on habitat constraints and generation of diversity in freshwater macro-invertebrates by I. Ribera.

The book *Aquatic Insects: Challenges to Populations* thus provides not only a good source of information on a variety of topics, but it is also a thought provoking read and a pointer towards less well covered areas of aquatic entomology. It is a comprehensive source of information for all researchers interested in the adaptations of aquatic insects to their environment. I would also recommend it as valuable reading for those who need to develop a more detailed understanding of the challenges aquatic insect populations are facing in today's changing world.

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