

Book review

Arthropods of tropical forests: spatio-temporal dynamics and resource use in the canopy. Basset, Y., Novotny, V., Miller, S.E. and Kitching, R.L. (eds) (2003); Cambridge University Press, Cambridge, vii + 474 pp. Hardbound, ISBN 0-521-82000-6, Sterling £75.

In 1982, Terry Erwin published a short, but enormously influential paper in the *Coleopterist's Bulletin* based on the results of canopy fogging work in Panama (Erwin, 1982). This relatively new technique involved pumping a fog of fast-acting insecticide into the rainforest canopy and collecting the resulting rain of arthropods. Erwin, extrapolating from his beetle samples taken from a single-tree species, estimated the global number of insect species at around 30 million. The bulk of these were thought to live in the forest canopy.

Today, most entomologists would dispute the assumptions on which Erwin based his estimate, and most agree that the 30 million figure is too high. However, Erwin's work was immensely useful in focusing attention on the canopy of tropical forests as what he called the 'last biotic frontier' in entomological research. Inevitably, the early canopy studies were concerned largely with cataloguing and counting the diversity of arthropods – what might be described as the Victorian phase of canopy entomology. More recently, with the increased availability of canopy cranes and other forms of access into the tallest rainforest trees, researchers have begun to investigate the structure and ecology of these communities, the extent to which they vary in space and time, and their interactions with host plants. This book, and an earlier volume with which it shares many authors (Stork *et al.*, 1997), describes the fruits of this research.

The idea for the book arose out of a session on canopy insects at the XXI International Congress of Entomology held in Brazil in August 2000. Despite the rather jargon-laden title, this volume is an accessible collection of 35 chapters written by

the majority of the world's active canopy entomologists. The contributions are organised into five sections 'Arthropods of tropical canopies: current themes of research', 'Vertical stratification in tropical forests', 'Temporal patterns in tropical canopies', 'Resource use and host specificity in tropical canopies', and 'Synthesis: spatio-temporal dynamics and resource use in tropical canopies'. These groupings are rather loose and I found it difficult to see why many of the chapters had been placed in particular sections. 'Canopy' is interpreted quite broadly (indeed, some of the contributors subscribe to the view that all elements of the vegetation above the ground should be included within the definition of the forest canopy). These minor criticisms aside, I found most of the chapters interesting and informative, especially those that attempted a synthesis of recent work. By their very nature, canopy studies tend to be small in scale and subject to the idiosyncrasies of individual study locations. The broader picture may become apparent only through the integration of studies in different locations.

Just two of the chapters (Floren and Linsenmair on 'How do beetle assemblages respond to anthropogenic disturbance?' and Speight *et al.* on 'Influences of forest management on insects') explicitly address conservation issues, although the rapid destruction and modification of forests throughout the humid tropics inevitably looms large over the whole field. In some ways I found the forest management chapter one of the least satisfactory. It is neither a formal review of studies of forest management effects on insects, nor a presentation of new research data. Speight *et al.* summarise their own work on insect assemblages in Malaysia, and conclude that the effects of fairly severe habitat modifications on insect richness are rather limited. An uncritical reader might conclude that we can replace forests with plantations of oil palms and other exotics without worrying too much about impacts on insects. However, increasingly, tropical ecologists are realising that species richness may not be the best metric for assessing human

impacts: this measure overlooks the rarity, degree of specialisation and functional diversity of insect assemblages in different forests. Habitat modification may lead to little effect or even increases in species richness, but this may mask a homogenising effect where the same disturbance-resistant taxa predominate over wide areas.

The book is beautifully produced and comprehensive. I recommend it as the best introduction available into the burgeoning literature on tropical canopy arthropods.

References

- Erwin, T.L. (1982) Tropical forests: their richness in Coleoptera and other arthropod species. *Coleopterist's Bull.* 36, 74–75.
Stork, N.E., Adis, J., and Didham, R.K. (1997) *Canopy arthropods*. London: Chapman & Hall.

O.T. Lewis
*Department of Zoology, University of Oxford,
South Parks Road, Oxford OX1 3PS, UK*