Book Reviews

Spiders in agroecosystems: ecological processes and biological control. Edited by M.H. Greenstone & D. Sunderland. Proceedings of a symposium. XIV International Arachnological Congress. Chicago, Illinois. June 1998. *Journal of Arachnology* **27** (1), 1–400. $50.00.

In the literature on biological control of insect pests, spiders are arguably relatively poorly represented. In part this can be attributed to the shortage of professional arachnologists and in part to a lack of wider appreciation of the significant impact these predators have on insect pests of agriculture. It is, therefore, refreshing to find an up-to-date discussion devoted to this neglected area. The papers in this symposium bring together the experience and views of 16 workers in this field, principally from the United States and Europe.

The focus of the symposium is firmly ecological, as opposed to practical pest management, with only one paper (by Susan Riechart) which discusses crop losses prevented by spider predation in agricultural systems. This can be justified in terms of our very poor understanding of the mechanisms by which spiders exert control on pest populations and of the factors that influence predation rates. The papers cover a wide range of topics, ranging from guild structure of spiders in major crops (Uetz *et al*.) through dispersal (Suter, Thomas & Jepson, Samu *et al*., Topping), prey choice (Toft, Nyffler) and aspects of predation (Greenstone, Hodge). While all are relevant to spider control of pests, a few are perhaps only incidentally so – the paper by Suter on 'The physics of ballooning in a chaotic atmosphere' being a case in point. A key paper for our understanding of the conditions for successful control of pests by spiders is that on 'The hows and whys of successful pest suppression by spiders' by Susan Riechert which should certainly be required reading for anyone interested in spiders in pest management. The contribution by Ann Rypstra on 'Architectural features of agricultural habitats and their impact on the spider inhabitants' is important, if only because it is potentially possible to manipulate crop architecture to enhance spider predation. Likewise, the paper by Wise and colleagues on 'Spiders in decomposition food webs of agroecosystems: theory and practice' underlines the importance of prey other than pests as alternative food sources for spiders (and indeed other generalist predators) which may also provide a way of enhancing natural enemy control of pests in some agricultural systems.

Fascinating and stimulating though many of the contributions to this symposium were, as a pest management entomologist I felt that there were two topics which might have enhanced its usefulness. The first was an account of the successes and failures of practical initiatives to use spiders in pest management, with some analysis of the underlying ecological reasons for the outcomes in each case. The second was the inclusion of some account of the use of spiders for pest management in tropical agroecosystems. Although mentioned in passing in the paper by Riechert, the key role of spiders in controlling planthopper pests in rice (the most important staple crop in the world) was never discussed. Since this is a classical example of a 'success story' in the use of spiders in biological control, some account by those who were involved in elucidating their role would have been welcome.

Matthew Greenstone and Keith Sunderland are to be congratulated on the high standard of production and proof reading of this volume. The absence of any obvious typographic or other errors is what we have come to expect from the publications of the American Arachnological Society. At US$ 50.00, the price is reasonable by today's standards and represents good value for both pest management specialists and arachnologists with an interest in the field.

Tony Russell-Smith

Mites: ecology, evolution and behaviour. By D.E. Walter & H.C. Proctor (Wallingford: CABI Publishing, 1999). 352 pp. Hard cover £42.50 (US$ 70.00). ISBN 0 85199 375 3.

'The study of mites – "acarology" – is a disappearing science' lament the authors in the preface to this book. This book will make an important contribution to reversing this trend as anyone who reads this book cannot fail to be stimulated by the astounding diversity of habitats, behaviour and morphology of mites.

The book begins by questioning the vertebrateocentric view of animal diversity with a comparison of the numbers of vertebrate and invertebrate species currently classified, and then outlines the aim of the book in redressing the balance by focusing on mites. A review of the origins of mites is followed swiftly by a fascinating discussion of their complex and sometimes confusing taxonomy. The book outlines the range of life cycles and life histories exhibited by mites, from the full seven stage life cycle of sarcoptiform mites, to the one stage cycle of heterostigmatids, where all the pre-adult development occurs within the body of the mother.

The section covering reproductive life history is particularly fascinating, as it seems that mites have evolved every possible mode of reproduction and sperm transfer it is possible to imagine. The discussion of the evolution of sperm transfer, through the selective forces of sperm competition makes for particularly interesting reading.

The authors then lead us through the range of habitats occupied by mites, explaining how morphological adaptations allow them to occupy every form of habitat from the soil in Antarctica, to the anuses of fruit bats and the ears of moths. There is also a discussion of the possible mutualisms between mites and their animal or plant habitats which is most enlightening.

Having described their astounding diversity, the authors produce an estimate for the global diversity of mites of over one million species, and also describe how this fits with May's size–species relationship. The book then concludes with a section describing how mites can be used as