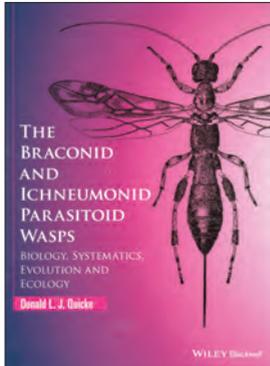


BOOK REVIEWS

'THE BRACONID AND ICHNEUMONID PARASITOID WASPS: BIOLOGY, SYSTEMATICS, EVOLUTION AND ECOLOGY' by DONALD L.J. QUICKE. Hardback, 2015, xv + 681 pp., 52 colour plates; numerous black and white illustrations. Published by Wiley Blackwell; ISBN 978-1-118-90705-4. Price: £130.00. Also available as an E-book at £117.99.



To the relatively few entomologists who have made Ichneumonidae and Braconidae (=Ichneumonoidea) a large part of our lives, it always seems truly amazing that so few others have done likewise. Where else do you find ovipositors that can be steered to chase hosts round bends in their substrate, eggs that feed and grow many thousand-fold before hatching, special cells that originate from the serosal membrane that not only keep on growing by absorbing nutrients from the host's haemolymph later to be eaten by the parasitoid larva but also secrete biochemicals in support of it, single eggs producing whole broods, females that stay with their gregarious brood while the larvae develop, venoms that after a delay when the host

feeds normally switch it to an arrested prepupa (often precociously), viruses to knock out the host's defences that are carried in the genome of the parasitoid to be secreted and injected into the host along with eggs, oviposition strategies that avoid the host's response altogether by placing the egg in a safe site such as a nerve ganglion, adults sitting in a pool of antifreeze in their cocoon through the winter, larvae breathing under water by spinning an oxygen exchange plastron, tiny drought resistant larvae that sit on pedestals waiting for a host to brush past but which can only develop further if that host is itself parasitised, and – throughout – mothers who choose the sex of their offspring (and all that that entails)? And what about the mechanisms and behaviours that lead them to fix upon and subsequently detect and accept only the 'right' hosts, or to determine the single survivor when two obligatorily solitary parasitoids find themselves in the same host individual, or indeed that enable a parasitoid larva not only to survive inside a growing host but also to dictate its behaviour, or the many areas of the body involved in the vast amount of chemical and other sensory processes that dominate the behaviour of adults? It is no accident that Ichneumonoidea are so hugely speciose as successful and specialised organisms; through great opportunity and tough times, evolution has superbly equipped them.

But to best understand and appreciate all this glorious and varied biology (even phytophagy comes into it), it needs to be set in an evolutionary context; an understanding of the phylogeny of the Ichneumonoidea as a whole. After a more generally approached overview of morphology and biology, in this book Professor Quicke is very determinedly driving along that road, melding an account of the biology of each group of Ichneumonoidea with discussion of the (currently best) classification framework that he himself has been in the vanguard of establishing, at first through a varied and innovative series of anatomical approaches before the massively trumping advent of molecular genetics, into which he then threw himself with unashamed conviction. Indeed, simply as a testament to the enormous effect of

gene sequencing on changing ideas of the classification of Ichneumonoidea over the past 30 or so years, this book has a lot to say.

The substantial format (page size 24.5 × 18.5cm) as well as sheer length makes for a rather massive 1.65kg for the hardback, so the E-book may be more convenient for many users. The work is arranged in a large number of parts, chapters and sections, with good internal cross-referencing, and generous space given to illustrations, tables, diagrams, bar charts etc. Half-tone photos are used in the text close to where a topic is discussed, and the most suitable of these are then replicated elsewhere in groups of colour plates. The work is furnished with a short glossary (5pp.), list of references (85pp. – it is an excellent feature that so much original work is referenced), author index (19pp.), general index (6pp.), host index (5pp.), ichneumonoid index at generic level and upwards in which subfamily placements are given for each entry (12pp.), and finally an index to species names of Ichneumonoidea with their generic placements (5pp.). From only brief sampling, this full indexing seems to work well, in which case to do it in this very comprehensive way was a very worthwhile effort. Not quite so successful has been the worthy attempt to give authors of referenced papers their initials when there are others with the same surname (many citations still went without), and both author and publisher should have demanded of the other that there was another round of proof reading, as minor and typological errors are high enough to look simply careless. There is also a bit of outdated nomenclature that might have been cleared up with a less demanding production schedule. A good feature of the work overall is that Quicke is prepared to offer occasional speculations, and he succeeds in maintaining an engaging and readable style.

Part 1 (186pp.) covers the general things in an expansive, thorough and comparative way: external morphology from a functional viewpoint, the processes and mechanisms of oviposition, internal anatomy and reproduction (both sexes), immature stages and their adaptations, the diversity of life history traits (solitary, gregarious, ectoparasitism, endoparasitism, idiobiosis, koinobiosis and the various forms of multiparasitism, superparasitism, kleptoparasitism and hyperparasitism), mating and sex determination, host location and learning, physiological reactions with the host including its immune system, and finally a section on convergent adaptations seen within the superfamily in which a range of both morphological features and developmental processes are covered.

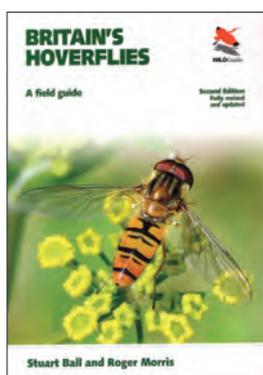
Part 2 (262pp.) is a treatment of the systematics of the Ichneumonoidea, first fully incorporating fossil evidence to examine origins, then focussing on the extant subfamilies (there are about 40+ in each family). These are organised within clades based very strongly on molecular evidence, with a review of the host associations and developmental biology (with good attention to relevance in pest control contexts) of each. This section includes numerous half-tone illustrations of mounted adult exemplars of the various subfamilies, which are sometimes rather sadly broken and bedraggled specimens (even of common taxa) hardly likely to win new recruits to their study, though I did personally much appreciate seeing here a few of the iconic and enigmatic genera that I am unlikely ever to see any other way – though not always with the features that makes them special visible. I suppose it is inevitable in a compilation of this kind that several of the biological abstractions from original papers are not quite spot on, but the advice must always be that readers should use summaries such as this to access the original papers and see it fresh for themselves, and in general the author has done a good job in reviewing such a large and scattered body of literature.

Part 3 (74pp.) is called Ecology and Diversity, and its sections cover many topics such as adult diet, fecundity, activity patterns, etc. as well as biological control, pathogens, mimicry, competition, host range and speciation, followed by a chapter on local and global patterns in diversity, and another giving advice on collecting and rearing (including mounting and labelling). There is then an epilogue that summarises the 10 key questions in each of four categories (phylogeny, host and parasitism, physiology, and ecology) that in Quicke's view could best advance our knowledge.

Overall, small glitches aside, this substantial book is a major achievement, giving with considerable originality and flair a comprehensive and unique treatment of a fascinating, diverse and important group of organisms, and it well deserves its place in any library. It will be a lasting reference source, although the nice thing is that it is not the final word as there remains an awful lot to be discovered, and indeed Quicke has pointed out several uncertainties and areas of need. For the saving of doubt, this book is not intended to help you with identification, but it should go a long way towards giving Ichneumonoidea their deserved place in the sun that, illogically, they have never yet attained.

MARK R. SHAW

'BRITAIN'S HOVERFLIES: AN INTRODUCTION TO THE HOVERFLIES OF BRITAIN', by STUART BALL and ROGER MORRIS. Second edition, 2015, 312 pp, illustrated with colour photographs. Published by Princeton University Press; ISBN 978-0-691-16441-0. Price £24.95.



Originally published in 2013, a second edition of this superbly illustrated photographic field guide to British hoverflies has now been published by Princeton University Press in their WildGuides series. It is written by Stuart Ball and Roger Morris from the British Hoverfly Recording Scheme, and mostly provides an introduction on how to identify the commoner British species, with advice on when and where to find them and provide some information about their life histories. Over half of the species which occur in Britain are illustrated, including at least one representative of each genus. There is enough information on the remaining British species to make possible the identification of most specimens using this book, except for the small minority of

difficult genera for which it is recommended that the reader should refer to other identification guides such as Stubbs & Falk's 'British Hoverflies', where these groups are covered in much more detail.

The first edition of this book was extremely well received and its success has greatly surpassed the authors' expectations, but they felt that there have been more than enough changes in the short time since to make a revised edition essential. To begin with, there have been a few recent taxonomic changes mostly involving species being assigned to different genera, and two further species have since been recorded in Britain, taking the total to 283. However, probably the biggest change is in the number of new photographic plates that have been inserted, which has increased to over 650. In some cases, both sexes are now illustrated when only one