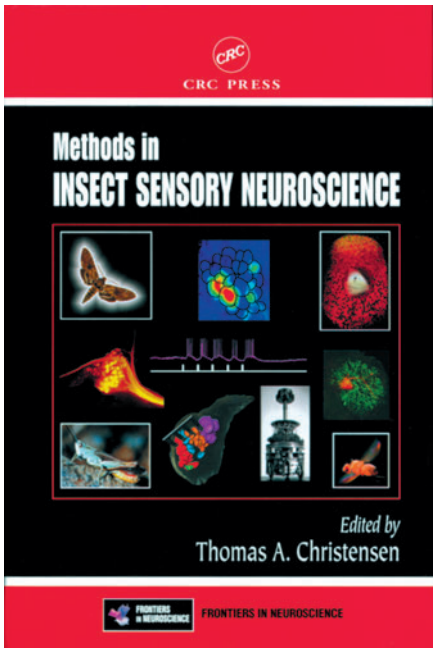
Book Review

INSECT SENSATION?



Methods in Insect Sensory Neuroscience

Edited by T. A. Christensen

CRC Press (2005)
435pp. ISBN 0-8493-2024-0
£79.99/$139.95 (hbk)

In moments of experimental crisis, we have surely all reached for our own particular 'bible' of laboratory methods, either to search for an answer – or to find something to blame. For most of us, this bible might be an in-house lab manual built up over years or a collection of research papers that deal particularly thoroughly with the minutiae of important procedures. *Methods in Insect Sensory Neuroscience* sounds like a book that could provide an important addition to this armoury. It is the latest in the *Frontiers in Neuroscience* series, which includes *Methods for Neural Ensemble Recording* and *Methods in Chemosensory Research*. The stated aim of this series is to 'present the insights of experts on emerging experimental techniques and theoretical concepts' and to highlight 'tricks of the trade' alongside details of specific equipment and suppliers.

The book is organised into five main sections, each containing several chapters written by different authors. The first section – 'Introduction: multimodal signal integration and behavior' – provides, in two chapters, a readable but necessarily brief overview of insect sensory biology, with almost no reference to methods. The second section – 'Mechanosensation and audition' – provides three chapters dealing, respectively, with chordotonal organs, flight control and auditory processing. Between them, they begin to point out the theoretical and methodological underpinnings of studies that have contributed to knowledge in these areas, with some of the specific 'tricks and tips' that were promised in the Preface. The three chapters of Section 3 – 'Vision' – introduce the reader to methods used in studying compound eyes, ranging from details of the methods required to analyse eye-shine in different species through to the design of biomimetic 'eyes' for robots. Sections 4 and 5 – 'Molecular characterisation of chemosensory systems' and 'Population analysis of sensory systems' – deal primarily with chemosensory and olfactory processing, giving the book a definite bias towards these modalities (six chapters).

The level of methodological detail that is provided differs greatly from chapter to chapter. C. Giovanni Galizia and R. S. Vetter provide the closest to a 'cookbook' of methods. Their chapter ('Optical methods for analyzing odor-evoked activity in the insect brain') is sufficiently detailed that it could save a novice considerable time in understanding key technical issues and setting up a new system. Many of the other authors, however, have provided very little specific methodological information. Their chapters are really reviews of the field, so this book is not the best starting point for a novice who is looking for methodological detail.

In practical terms, a reference book of methods should permit a reader to find a topic of interest quickly. I tested the Index with a selection of topics. The entry for a commonly used fluorescent dye – Lucifer Yellow – referred me to only 1 page, which in turn referred to a 1983 review rather than to any specific details or more recent uses. 'Green fluorescent protein' (GFP, a marker that has many uses in sensory neuroscience) referred me to three pages, but none of these provided any real methodological details. 'Tip recording' did not appear in the Index – but this method of recording sensory activity from the shafts of trichoid sensilla is described in quite some detail in the text, complete with a figure. Overall, then, the Index is rather scattergun in its coverage.

The text is generally well written and carefully edited, so it is easy to read. The figures are printed in black and white, with some of the key ones reproduced in a block of high-quality colour plates near the centre of the book. The overall layout is

simple and clear. A USA-centric list of suppliers completes the book, providing a snapshot of some of those offering key bits of equipment.

Methods in Insect Sensory Neuroscience provides an uneasy balance between reviewing this diverse field and highlighting important methods. It does not have the level of detail present in, for example, Strausfeld and Miller's *Neuroanatomical Techniques: Insect Nervous System* (Strausfeld and Miller, 1980) or *Microelectrode Techniques. The Plymouth Workshop Handbook* (Ogden, 1994). These, particularly the former, really enable a reader to get a new technique up and running. *Methods in Insect Sensory Neuroscience* is a different sort of book. I would give it to a new PhD or undergraduate project student to broaden their view of experimental possibilities and to provide them with an overview of the sorts of questions that different labs are tackling. It would act as an entry point to the literature of the field and to some of the key methodological papers. Importantly, it would provide the student with a sense of the intense and exciting research going on in insect sensory neuroscience. What it will not do, however, is to explain why their tungsten electrodes are not sharpening properly or tell them how to check the critical features of a visual stimulus display that are required for obtaining artifact-free visual responses in different species of flies.

10.1242/jeb.01654

References

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Strausfeld, N. J. and Miller, T. A. (ed.) (1980). *Neuroanatomical Techniques: Insect Nervous System*. New York: Springer-Verlag.

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