Book Review


Just as this review approached completion, the sad news of the death of Nils Møller Andersen arrived from Copenhagen. Nils died, aged 63, on 12 May 2004. As his obituaries surely will state, this is a sad and premature loss to entomological systematics. Nils’ studies of the Heteroptera – notably the semi-aquatic bugs or gerromorphans – exemplify the depth and breadth expected of a modern systematist. These range through detailed functional morphology, cladistics (including methodologies), molecular and combined studies, biogeography and interpretation of fossils. Nils did not neglect fundamental revisionary works and catalogues: indeed, according to Niels Peder Kristensen, the world catalogue of Gerromorpha is essentially complete and will be published to add to the substantial volume of systematic work left by Nils.

Thanks to an Ebbe Nielsen-inspired collaboration with Tom Weir, Nils Møller Andersen became a regular visitor to the Australian National Insect Collection (ANIC) in Canberra. Although well-known as the driest (non-Antarctic) continent, Australia provided a focus for much of Nils’ later work on aquatic bugs. For many years Tom Weir had been collecting water bugs, particularly in remote and spectacular locations. In tropical northern Australia, seasonal waterbodies are frequent, as they are around the wetter continental margin and even sporadically in the arid centre; they support a diverse and endemic aquatic insect biota. Add to these the marine estuaries, mangroves, tidal reefs and open tropical oceans, and the preferred habitats of water bugs are very well represented. The collaboration between Nils and Tom in the field and in the collection halls has resulted in this excellent monograph filled with beautiful illustrations, including four plates of nostalgia-inducing habitat photographs.

The volume commences with a review of the general biology and the ecological and geographical distribution of the Australian water bugs – using the terms ‘semi-aquatic bugs’ for Gerromorpha and ‘aquatic bugs’ for Nepomorpha. Slightly less than half the genera, but most species, are endemic to Australia. Other genera are either South-east Asian or more widespread. Notable in the Australian fauna is the high percentage of semi-aquatic bugs that are marine (including those inhabiting mangroves and coral reefs). Within Australia, species diversity tracks high rainfall and temperature, and seemingly fails to reflect classical Torresian, Bassian and Eyrean regionalization or the biogeographical ‘break’ of the Macpherson–Macleay overlap. Certainly in many parts of the world, newly created aquatic habitats are colonized rapidly by certain dispersive (winged) water bugs. Andersen and Weir review their earlier studies on the relationship between wing polymorphism and habitat type, including ephemerality. The vigility of winged taxa perhaps overrides regional biogeography, and might detract from their advocated role as biomonitors, since, being independent of dissolved aquatic oxygen, they tend to be less reliant on good water quality.

This concise but very interesting opening section is followed with a succinct review of the higher classification employed, including mention of extra-limital families (Paraphronyvelidinae and Macrovelidinae in Gerromorpha; Potamocoridae and Helotrephidae in Nepomorpha). For non-specialists in the group, the informative and well-balanced discussion of the familial level phylogeny is invaluable. For the Gerromorpha, this derives from Andersen’s (1982) earlier manual Hennigian approach, but there is reference to a quantitative cladistic analysis by Andersen & Weir to appear in Invertebrate Systematics (in press), which ‘supports Andersen’s initial hypothesis’. Slightly detracting from the book are a few statements concerning ‘plesiomorphic’/‘apomorphic’ taxa based on the polarity of one or few major features. A brief critique of one existing molecular study of Gerromorpha is used to advocate ongoing combined analyses. The phylogeny of the Nepomorpha presented is somewhat speculative, being derived from several sources, and with limited illumination from molecular studies. However, all this is to change with the imminent publication of a combined analysis for Nepomorpha (Hebsgaard et al., 2004).

A short section on fossil water bugs – which actually is an impressively rich record – includes an Australian Lower Cretaceous mesoveliid nicely photographed by David Grimaldi, and tables of the putative gerromorphan and nepomorphan phylogenies overlaid on the geological time scale. A well illustrated chapter on identification precedes a concise guide to collection and specimen preparation, followed by a traditionally dichotomous key to adults of the Australian families. Neophytes to identification of aquatic bugs, versed in entomological morphological terminology, may complement the keys in this book with an on-line approach using Lucid™keying technology, prepared by the Centre for Biodiversity and Conservation Research at the Australian Museum (Cassis & Elliot, 2003).

The bulk of the remainder of this volume (pages 67–308) comprises individual chapters, one per family, organized in a homogenous manner and beautifully illustrated with line drawings (both habitus and showing diagnostic structures), scanning electron micrographs and maps. Although most of
the illustrations have appeared elsewhere, there is a notable coherence to the layout, style and labelling. Interspersed in the text are a further four plates dramatically showing many aquatic bugs (and Tom Weir) going about their daily business. Users of this book may decide for themselves if the vaunted ability to attach numerous colour images to electronic keys such as Lucid™ does indeed provide an advantage over the quality photographs, professional paper-based ink drawings and greyscale SEMs of the calibre presented in this work.

Each family chapter contains a key to the Australian genera, and under each genus, a key to species, some notes on the biology and a summarized distribution. One slightly detrimental aspect of the standardized layout is that the continental map provided in association with many taxa fills nearly 60% of a page, whether the plotted taxa occur over most of the continent or just south-western Western Australia. Some variation to include column-width sections of what is a familiar continental outline might have improved layout, in what otherwise is a delight to the eye. The work concludes with extensive references, a list of abbreviations for institutions, and a valuable checklist located in an Appendix.

Although I advocate getting our biodiversity stuff out via the web or CD, with lots of pictures and ‘idiot-proofed’ interactivity to compensate for contemporary lack of training in anatomy, I fell for this book. It is a model of presentation of non-redundant information, well laid out, easy to use, and visually attractive from cover to cover (the bugs on the front, the authors on the back). Of course, unavoidably, this sort of quality comes at a price.

Finally, I return to the distressing loss of the senior author at a most productive time in his life. Freed from his (very successful) administration in the Copenhagen Zoological Museum, Nils promoted quantitative and ecological phylogenetics, served on editorial boards and organized and participated in international meetings, all the while publishing prolifically on semi-aquatic bugs. His collaborations and encouragement of others in the study of aquatic Heteroptera leaves a legacy on which others can build – the field was not Nils’ monopoly. Among interesting recent developments, the biogeographical studies of the Polhemii, the phylogeny-based understanding of male-tending nepomorphans (e.g. Smith, 1997) and the deeper understanding of male genital structures (Keffer, 2004) come to mind. The Australian Waterbugs is a fitting and exemplary legacy of an inspirational career.

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References


