



MILLER K.B. & BERGSTEN J. 2016: DIVING BEETLES OF THE WORLD. SYSTEMATICS AND BIOLOGY OF THE DYTISCIDAE. John Hopkins University Press, Baltimore, 320 pp. ISBN 978-1-4214-2054-7 (printed); 978-1-4214-2055-4 (electronic). Price USD 150.00.

This new book by Kelly Miller and Johannes Bergsten adds to the recent, praiseworthy upsurge in books on dytiscids. In 2014, Donald A. Yee wrote in his introduction to another publication that more books on diving beetles are needed because they are “cool” – interesting, beautiful, and little studied. While they are definitely interesting, their beauty is a matter of personal taste. They do not match the colourfulness of butterflies and jewel beetles but are fascinating in their own right, as this book aims to show. At any rate, they are not little studied. On the contrary, dytiscids are among the most thoroughly studied beetle groups! There is not another large family with over 4000 species for which there is a regularly updated world catalogue, a complete phylogeny based on morphological and molecular characters of > 60% of the genera, modern molecular studies of the biogeography of entire subfamilies and tribes, ubiquitous use of molecular analyses in the description of new taxa and hundreds of ecological studies. The latest book “Diving Beetles of the World” is just another proof of how well these beetles are known.

Its subtitle “Systematics and Biology of the Dytiscidae” hints at the fact that the book covers, in more or less detail, most aspects of the current knowledge on this family. Their biology is covered mainly in a concise, 25-page introduction, which succinctly summarizes their adaptations to life in water, modes of dispersal, defence strategies, trophic and other relationships with other groups of aquatic organisms, reproduction, and development. This part is complemented by a list of the most important habitats including photographs, brief summary of the fossil record, collecting techniques and preservation methods.

The second part of the book covers the general aspects of their systematics. It contains a taxonomic diagnosis of the family and brief history of the study of their systematics. The richly illustrated morphological characteristics of the larvae and adults put emphasis on the diagnostic characters used in the classification of the family, and is followed by keys to the subfamilies for larvae and adults. The subterranean and terrestrial representatives are keyed separately; this makes good sense as the inclusion of the highly aberrant subterranean and terrestrial species in their respective tribes and genera would render the descriptions almost useless.

The main and most important part of this book deals with individual subfamilies, tribes and genera. Each of them is characterized by the size range of its members, group diagnosis, summary of its classification, brief estimate of its diversity, preferred habitats and geographical distribution. Entries on subfamilies and tribes contain keys to lower taxonomical levels: tribes (if any) and genera. The keys are usually based on simple, easily observed characters and accompanied by illustrations. Nevertheless, they should be used with caution. While they work well for most, i.e.

typical representatives of the group, they simply cannot cover all special cases and exceptions. This is inevitable: many groups are highly speciose and morphologically diverse, and the delimitation of many genera is based on molecular characters without clear morphological autapomorphies. One of us (JH) needed to update the key to the genera of the Colymbetinae for a project and at first thought that a simple update of the key published in this book would suffice. After a few days of futile attempts, it proved impossible to produce a straightforward key that would be valid for all species.

The distribution of individual genera is illustrated in maps. These are worth a thousand words, but can be more prone to inaccuracies: for example, the distribution of *Meladema* probably does not reach so far into the Sahara (Map 9.5), and the nominate subspecies of *Carabdytes upin* is present also in the Indonesian part of Papua, contrary to Map 9.2.

For a more casual user, the most attractive part of the book should have been the photographs of the representatives of all diving beetle genera (except the subterranean genus *Sinodytes* from China, known only from the holotype). Unfortunately, this aspect of the book is rather disappointing. The images are only ca. 6 cm in size and their quality does not fully meet current standards. Although the photographs illustrate the diversity of the family, they largely convey the fact that most diving beetles are indeed similar, rather than show the beauty and peculiarities of the individual genera. It must have taken a lot of effort to obtain and photograph all the specimens. It is a pity that the result is not as perfect as one would wish, even if it meant larger photographs (4 per page would have been optimal in our opinion) and hence more pages and a higher price.

The authors did not make the usual reviewer's tasks, i.e. finding mistakes and omissions, particularly easy for us. The book must have been proofread with great care. It contains very few mistyped words, such as “Linneaus” instead of “Linnaeus” in the very first paragraph of the text on page 1 and missing *i* in the word *kalimantanensis* in the legend of Fig. 37.53 (*Borneodessus zetteli kalimantanensis*). The term “visible sternite VI” (p. 35) is somewhat unfortunate; it should have read “sternite VII” or “ventrite VI” to be in line with the rest of the text. There are also a few factual errors. For example, Ribera & Faille (2010) did not describe the subterranean species of the genus *Graptodytes* from Europe, but from Morocco (p. 13). Some species of the genus *Hydronebrius*, such as *H. amplicollis* from China, do not have a cordate pronotum (p. 65). Unlike the statement on p. 72, *Colymbetes minimus* also has transverse grooves on the elytra, even if they are much sparser and shorter than in the other *Colymbetes* species. Some *Exocelina* species (e.g. *E. aubei*, *E. baliem*) have longitudinal striae or striolae on the elytra (p. 84). *Philodytes* does not exhibit a reversal to the plesiomorphic state of simple metatarsal claws, but of simple metatibial spurs (p. 101). *Yola* is also known from Cambodia in the Oriental Region (p. 257). However, all these mistakes are minor and entirely dwarfed by the sheer volume and quality of the information this book provides.

Within less than six months after its publication, this book has already become a classic on the topic. From now on, we do not need to explain anything on diving beetles to anyone anymore. Instead, we can simply refer to a page in the Miller & Bergsten book. As far as we are concerned, this is the ultimate accolade for a book of this kind.

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