

Book review

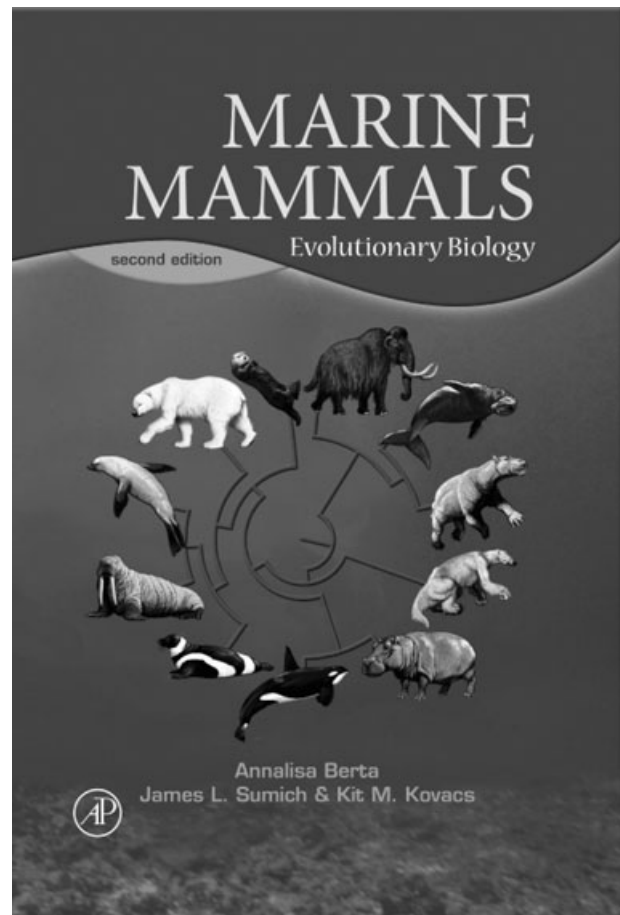
Review of *Marine mammals: evolutionary biology* (second edition), by Annalisa Berta, James L. Sumach & Kit M. Kovacs (2006). Burlington, MA: Academic Press. 547 pp. ISBN 0-12-088552-2.

The ever-popular field of biology that focuses on mammals that evolved to exploit the marine environment has spawned a suite of texts in the last decade. These have been dedicated to the evolution, systematics, morphology, anatomy, physiology, behaviour, sociobiology, ecology and conservation of this well-studied group. Berta et al.'s latest addition to this literature is an impressive advancement of their first edition (2003), and is certainly the only major authored work of its kind [the competing texts are all edited works: Reynolds & Rommel's *Biology of marine mammals* (1999); Hoelzel's *Marine mammal biology: an evolutionary approach* (2002); and Perrin et al.'s *Encyclopedia of marine mammals* (2002)]. Although there is considerable overlap and repetition among texts, Berta et al. have deliberately carved out their own niche by focusing heavily on the systematics of the varied taxa this group comprises. The book is unsurpassed as a marine mammal systematics and phylogenetic reference source, with more compiled detail on the evolution of cetaceans, pinnipeds and sirenians than is found in all the other texts combined.

Indeed, the first 111 pages of this 547-page volume are devoted entirely to systematics and evolution (Chapters 1–5), followed by a short Chapter on biogeography (this makes up the first section of the book: “Evolutionary history”). Although absolutely thorough in their treatment of this area, there is a strong emphasis on morphologically based phylogenies, but the lack of genetic evidence presented in the book may be attributed to the general paucity of such data for these taxa. The second section is a more eclectic mix of anatomy, morphology, physiology, population dynamics and behaviour (Chapters 6–15), with all but the final two chapters built around the strong evolutionary frame established in the first section. The final section is an appendix detailing the classification, and both current and fossil distribution of marine mammal species, followed by a series of colour plates showing some characteristic species. Each Chapter

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also includes an exhaustive list of most major primary literature.

The individual chapters are supported by a healthy number of informative schematic drawings, photographs, tables and graphs, although the quality of the black and white photographs and colour plates is variable. I also found that many of the anatomical schematics lacked some important labelling that would have aided the interpretation of the detail provided in the text. That said, most of the line drawings are well crafted and useful for readers possessing a little anatomical education, and the taxonomic comparisons these drawings serve to illustrate are brilliantly achieved.

In what is perhaps symptomatic of the field of “marine mammal science” itself, rather than a failing of the book, the authors largely restrict their discussions, comparisons and scientific evidence to marine mammals alone (the

Preface exposes this perspective in full). Although this may appear to be a logical and obvious approach given the title of the book, there is an apparent reluctance to branch out to other taxa that have successfully evolved to exploit the available niches the marine environment offers, and therefore to provide relevant analogies. Indeed, there is almost no discussion of marine birds and reptiles (e.g. penguins and marine turtles), some of which have been studied in far greater detail (especially with respect to physiology, reproduction and foraging strategies). This would have broadened the scientific and didactic appeal of the book. Apart from the taxonomic peculiarities of marine mammal phylogeny, there is nothing inherently unique about marine mammals that has not been covered in other major disciplines of biology. Although many marine mammals provide ideal model systems for the study of major topics in these fields, the artificial, and rather ad hoc, delineation of “marine mammal science” as a specific discipline risks encouraging a lack of appreciation for related and supporting evidence beyond these strict taxonomic confines. The almost cursory addition of otters and polar bears, which are included simply because of their ability to exploit marine resources to some extent, seems somewhat contrived. The book also suffers from a certain bias towards Northern Hemisphere research, is missing some key references and developments [e.g. Atkinson’s (1997) review of pinniped reproductive biology, Noad et al.’s (2000) work on whale songs, and Butler’s work on diving physiology and metabolism (Butler & Jones 1997; Butler 2004)], and the final Chapter on “Exploitation and conservation” seems tangential to the theme of the rest of the text. In a book of this size it can also be expected that some typographical and spelling errors will occur, although the occasional use of non-SI units and archaic terminology that most biologists now consider inappropriate for the species described (e.g. “rookery”, “cow”, “bull”, etc.) should probably have been avoided.

That said, the book has many strengths beyond its comprehensive treatment of evolution and systematics.

The inclusion of a Chapter on energetics in this edition is a good overview of the field, which has benefited greatly from the study of many model marine mammal species. Other highlights include the excellent and concise treatment of respiration and diving physiology (Chapter 10), the fascinating account of Mysticete feeding behaviour (Chapter 12), and the exhaustive description of the evolutionary successes in adapting to the constraints imposed on air-breathing vertebrates living in an aquatic environment. The concise summaries provided at the end of each Chapter are also helpful. Despite some flaws, the book does represent a good reference source that I will certainly use myself, and it will serve those who teach these themes extremely well. Berta et al. deserve to be congratulated for this comprehensive tome—it is a thorough, precise and clearly written reference that will serve admirably those interested in the evolution of marine mammals.

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References

- Atkinson S. 1997. Reproductive biology of seals. *Reviews of Reproduction* 2, 175–194.
- Butler P.J. 2004. Metabolic regulation in diving birds and mammals. *Respiratory Physiology and Neurobiology* 141, 297–315.
- Butler P.J. & Jones D.R. 1997. Physiology of diving of birds and mammals. *Physiological Reviews* 77, 837–899.
- Hoelzel A.R. 2002. *Marine mammal biology: an evolutionary approach*. Oxford: Blackwell Science.
- Noad M.J., Cato D.H., Bryden M.M., Jenner M.N. & Jenner K.C.S. 2000. Cultural revolution in whale songs. *Nature* 408, 537.
- Perrin W.F., Wursig B. & Thewissen J.G.M. (eds.) 2002. *Encyclopedia of marine mammals*. London: Academic Press.
- Reynolds J.E. & Rommel S.A. (eds.) 1999. *Biology of marine mammals*. Washington, DC: Smithsonian Institution Press.