

Marine Mammals: Evolutionary Biology (2nd edition)

by Annalisa Berta, James L. Sumich, Kit M. Kovacs. New York, Academic Press, 2006, 560 pages, ISBN 0-12-088552-2. £43.99 (hardback).

Marine mammals are scientifically one of the most enigmatic of animal groups to study. Although marine mammals are some of the largest of all animals in existence today or in the past, observations on them are limited. What glimpses we have into the world of this collection of megafauna are often fleeting or indirect. While we are largely confined to making observations in the air-rich environment above the waves, these animals can spend the majority of their time invisible in the twilight of the depths. As a consequence, we have an incomplete understanding of even the most basic of their biological attributes. There remains a paucity of information regarding population size, feeding ecology, energetics, reproductive behaviour and geographical distribution. Even the number of species of marine mammals is questionable. Despite the size of the animals, as if hidden 'in plain sight', new species are still being described. It is their size and special adaptations to living immersed in water that have also made marine mammals the targets of heavy exploitation. The unrestricted hunting practices of the past have led to the decimation of many populations of marine mammals and even, in some cases, to their extinction. Today, conflicting demands, with humans, on the environment further threatens these marine species.

The second edition of *Marine Mammals: Evolutionary Biology* by Annalisa Berta, James Sumich and Kit Kovacs successfully highlights the current state of knowledge on the diverse assemblage of mammals that utilise the marine environment. These authors have combined their expertise to produce a comprehensive treatise. The text has been updated and reorganised in places. The book contains appendices with complete descriptions of the taxonomy of all modern groups and a helpful glossary. Fifteen pages of colour plates have also been added. These plates show the behaviours as well as the diversity of morphological types. The authors have crafted an integrated text that does not suffer from being episodic, as have various multi-authored books on this subject. The book would be an excellent textbook for advanced courses in marine mammalogy. Indeed, all scientists and students who study marine mammals should read it.

The book is written at an advanced undergraduate level. Although some general biological concepts are introduced throughout the text (e.g., cladistics, biogeography), a working knowledge of zoology and evolution is required. Indeed, the book has a heavy evolutionary focus throughout the text. Whether it is feeding strategies, anatomical adaptations, reproductive patterns or diving behaviour, the authors have

attempted to put the subjects into an evolutionary context. This provides a conceptual framework for better interpretation of the unique aspects of marine mammals. In certain instances, phylogenies were used to elucidate evolutionary relationships among species within a particular clade. The use of phylogenetic analysis adds a different dimension to the book. Other books on marine mammals present any discussion of evolution in an almost story-telling format. Such evolutionary scenarios are often presented without critical analysis. By testing phylogenetic hypotheses, the authors have shown how evolutionary scenarios could be evaluated from the available data. For the discussion of locomotion, character states were mapped on phylogenies to provide insight into the evolution of the different swimming modes. This was an instructive exercise. Similar phylogenetic analyses should be provided on the other morphological and behavioural characteristics presented in the book.

Apart from the evolutionary theme, the book's major strength lies in the sections on the anatomy and physiology of marine mammals. The early chapters on evolution and systematics of the three primary groups of marine mammals (pinnipeds, cetaceans and sirenians) are highly detailed with respect to anatomical features. A new chapter on energetics has been added to the text. This chapter concentrates on thermoregulation and the metabolic effort of swimming. As more precise methods are developed to measure field metabolism and foraging efforts, energetics will be better integrated in discussions of reproductive strategies and sustainable population size. Another organisational change in the text from the first edition is the fusion of information on mating systems into the chapter on reproductive structures, patterns and strategies. This reorganisation is fully justified in placing all reproductive topics together in one chapter.

This book is an important resource and it should not be merely viewed as a classroom textbook. It contains a wealth of information. In addition to the biological aspects of marine mammals, the book also provides the history of exploitation and political attempts to manage and regulate hunting. Even though this review is presented in an unbiased manner, the conclusions are that current practices of overfishing may lead in the end to the demise of a number of species. Berta, Sumich and Kovacs present a hopeful plea that we can make future political decisions based on a sense of stewardship of the oceans and its inhabitants.

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