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Book Review

HORNS, TUSKS, AND FLIPPERS: THE EVOLUTION OF HOOFED MAMMALS. Editors: Donald R. Prothero and Robert M. Schoch. Johns Hopkins University Press, Baltimore and London, 2002. ISBN 0-8018-7135-2, 394 pp.

The hoofed mammals covered by this book include two extant clades of aquatic mammal—Cetacea (whales) and Sirenia (manatees)—along with the terrestrial Artiodactyla (even-toed hoofed mammals); Perissodactyla (odd-toed hoofed mammals); Proboscidea (elephants); Hyracoidea (hyraxes); and several extinct clades such as mastodons, mammoths, and brontotheres. Each chapter takes a particular clade and describes the fossil record of the lineage along with the biology of the extant taxa in amazing detail. Particularly interesting are the associations between hoofed mammals and humans highlighted by the authors (e.g., domestication), and the emphasis placed on current conservation concerns. All this information is interspersed with anecdotes about the biologists and palaeontologists, past and present, who have made important contributions to the understanding of hoofed mammal evolution.

The stated intention of this book is to make the evolution of the hoofed mammals more accessible to a general audience. Each chapter taken in isolation achieves this aim; the authors provide an easy to read and wonderfully detailed explanation of the evolution of individual clades. As one might expect from two palaeontologist authors, the descriptions of the fossil lineages and the morphological features that unite the clades are particularly well explained and interesting. It is, however, unfortunate that the structure of the book makes it difficult to use as a reference work as the index is full of pre-classification popular names. For example, you have to know that the okapi was once referred to as the "forest donkey" or that brontothere translates to "thunder beast."

The main weakness of the book is its examination of higher-level relationships between clades. The discussion includes only morphological evidence; the contribution that molecular phylogenetics has made to the understanding of hoofed mammal evolution has not been included. In the introductory chapter, the hoofed mammals are presented as a monophyletic group, which the editors refer to as ungulates. The existence of the superordinal ungulate clade is disputed by molecular phylogenetics (see Graur et al., 1997), which consistently splits the hoofed mammals between two distantly related superordinal clades. Molecular data, both nuclear and mitochondrial, group the elephants, hyraxes, and manatees together as members of a clade often referred to as Afrotheria, while the even- and odd-toed hoofed mammals cluster together within a clade sometimes known as Laurasiatheria. The whales are nested within the even-toed hoofed mammals (Madsen et al., 2001; Murphy et al., 2001). Therefore, if the molecular data are correct, this book is attempting to describe and synthesise the evolution of a clade that represents at least two independent evolutionary origins.

I would recommend this book to anyone interested in the morphological perspective on the evolution of hoofed mammals and particularly to those wanting to learn more about the fossil record of individual clades. It is enjoyable and informative, although for the price (€70, £46), the print quality of the book is disappointing.

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