

Mammalian Sexuality

The Act of Mating and the Evolution of Reproduction

There are more than 6000 species belonging to 27 orders in the Class Mammalia. Comparative studies of this diverse and magnificent array of extant species provide valuable opportunities to formulate and test hypotheses concerning the evolution of reproduction. This is the first book to explore, in depth and breadth, the complex interrelationships that exist between patterns of mating behaviour and the evolution of mammalian reproductive anatomy and physiology. It focuses upon the role that copulatory and post-copulatory sexual selection have played during the evolution of the monotremes, marsupials and placental mammals, and examines the effects of sperm competition and cryptic female choice upon coevolution of the genitalia in the two sexes. In addition, due weight is also given to discussions of the modes of life of mammals, and to the roles played by natural selection and phylogeny in determining their reproductive traits.

Alan F. Dixson is a Professor in the School of Biological Sciences at Victoria University of Wellington, New Zealand. His research has involved comparative studies of reproductive biology and the evolution of sexuality in primates and other mammals. During a distinguished career, he has held posts at the Zoological Society of London (1976–1983), Medical Research Council UK (1983–1999), International Medical Research Centre in Gabon (1989–1992), Sub-Department of Animal Behaviour, University of Cambridge (1993–1998) and was Director of Conservation and Science at the Zoological Society of San Diego in the USA (1999–2005). He has authored, or co-authored, more than 160 papers and books, including *The Mandrill: A Case of Extreme Sexual Selection* (Cambridge, 2015).

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ALAN F. DIXSON DSc

*School of Biological Sciences
Victoria University of Wellington
New Zealand*



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To Amanda

**In your heart my thoughts are born,
In your spirit the source of my words is found.**
(Translated from *The Letters of Michelangelo*)

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Preface

This is the first book about mammals that explores, in depth and breadth, the complex interrelationships that exist between their patterns of mating behaviour and the evolution of reproductive anatomy and physiology. It deals with the role played by copulatory and post-copulatory sexual selection, during the evolution of the monotremes, marsupials and placental mammals. Due weight is also given to discussions of the modes of life of mammals, and to the effects of natural selection and phylogeny in determining their reproductive traits.

There are more than 6000 extant species representing 27 orders of mammals. Comparative studies of this diverse and magnificent array of species provide biologists with valuable opportunities to formulate and test hypotheses concerning the evolution of mammalian reproduction. However, to make the most of such opportunities, a broad approach is required, one that gives proper weight to insights derived from research on copulatory behaviour and mating systems, as well as reproductive biology and evolution.

I count myself fortunate, because the seeds of this multidisciplinary approach have indeed germinated, and flowered, during the course of my own career as a zoologist. This process began in 1970 with the publication of Geoffrey Parker's ground-breaking insights concerning sperm competition. Gradually this new field of enquiry expanded and it is now well established that competition between the gametes of rival males for access to a given set of ova has been crucial to the evolution of reproduction in many groups of animals. Moreover, recognition of the phenomenon of cryptic female choice, initially by Thornhill and subsequently by Eberhard in the 1980s, has focused attention upon the potential for the female's behaviour, reproductive anatomy and physiology to influence which male's gametes are most likely to gain access to ova.

Much of the research on post-copulatory sexual selection has involved arthropods and other invertebrates, but there has been a steady increase in the number of studies devoted to vertebrate taxa. The results of work on mammals are still largely confined to specialist journals, however. In addition to these publications, there is a widely scattered literature dealing with mammalian copulatory behaviour, and a huge fund of

knowledge concerning the reproductive anatomy and physiology of monotremes, marsupials and placental mammals. My goal has been to create a synthesis of this material, thus making it readily accessible to research workers and to students. If the book achieves this goal, then the four years it took to write will have been time well spent.

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