

# Marine Mammals Evolutionary Biology

Marine Mammals The Origin and Evolution of Mammals Marine Mammals Evolution of Island Mammals The Rise of Marine Mammals Robustness, Plasticity, and Evolvability in Mammals Mammalian Evolution, Diversity and Systematics Marine Mammal Biology The Functional and Evolutionary Biology of Primates Colbert's Evolution of the Vertebrates Mammals from the Age of Dinosaurs Evolution of Life Histories of Mammals Studies in the Evolution of Animals The Unity of Evolutionary Biology Mammalian Evolutionary Morphology Outlines of Evolutionary Biology Mammal Societies The Comparative Method in Evolutionary Biology Evolution of Tertiary Mammals of North America: Volume 2, Small Mammals, Xenarthrans, and Marine Mammals Mammals Annalisa Berta T. S. Kemp Alexandra van der Geer Annalisa Berta Clara B. Jones Frank Zachos A. Rus Hoelzel Russell Tuttle Edwin H. Colbert Zofia Kielan-Jaworowska Mark S. Boyce Emanuel Bonavia Elizabeth Corning Dudley Eric J. Sargis Arthur Dendy Tim Clutton-Brock Paul H. Harvey Christine M. Janis Devra G. Kleiman

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marine mammals evolutionary biology third edition is a succinct yet comprehensive text devoted to the systematics evolution morphology ecology physiology and behavior of marine mammals earlier editions of this valuable work are considered required reading for all marine biologists concerned with marine mammals and this text continues that tradition of excellence with updated citations and an expansion of nearly every chapter that includes full color photographs and distribution maps comprehensive up to date coverage of the biology of all marine mammals provides a phylogenetic framework that integrates phylogeny with behavior and ecology features chapter summaries further readings an appendix glossary and an extensive bibliography exciting new color photographs and additional distribution maps

mammals are the dominant large animals of today occurring in virtually every environment this book is an account of the remarkable 320 million year long fossil record that documents their origin their long spell as no more than small nocturnal creatures and their explosive radiation since the extinction of the dinosaurs 65 million years ago tom kemp also unveils the exciting molecular evidence which coupled with important new fossils is presently challenging current thinking on the interrelationships and historical biogeography of

mammals the origin and evolution of mammals will be of interest to advanced undergraduate and graduate students as well as researchers in vertebrate palaeontology biogeography mammalian systematics and molecular taxonomy it will also be welcomed by vertebrate fossil enthusiasts and evolutionary biologists of all levels with an interest in macroevolutionary problems

special issue

evolution of island mammals evolution on islands differs in a number of important ways from evolution on mainland areas over millions of years of isolation exceptional and sometimes bizarre mammals evolved on islands such as pig sized elephants and hippos giant rats and gorilla sized lemurs that would have been formidable to their mainland ancestors evolution of island mammals second edition provides an updated and expanded overview of the current knowledge on fossil island mammals worldwide ranging from the oligocene to the onset of the holocene the book addresses evolutionary processes and key aspects of insular mammal biology exemplified by a variety of fossil species readers familiar with the first edition will find here a host of updated and enhanced material including an entirely new chapter on the island rule updated and expanded theoretical chapters updated and improved taxonomic information extensive coverage of new discoveries body masses or body size indices for most extinct island mammals new figures visualizing the richness of the fossil record this accessible and richly illustrated textbook is written for graduate level students and professional researchers in evolutionary biology palaeontology biogeography zoology and ecology

setting the stage rocks fossils and evolution the oldest marine mammals whales and sea cows later diverging whales neoceti aquatic carnivores pinnipeds and a bear like carnivoran crown sirenians and their desmostylian relatives aquatic sloths and recent occupants of the sea sea otters and polar bears diversity changes through time the influence of climate change and humans

among the unresolved topics in evolutionary biology and behavioral ecology are the origins mechanisms evolution and consequences of developmental and phenotypic diversity in an attempt to address these challenges plasticity has been investigated empirically and theoretically at all levels of biological organization from biochemical to whole organism and beyond to the population community and ecosystem levels less commonly explored are constraints e g ecological costs e g increased response error perturbations e g alterations in selection intensity and stressors e g resource limitation influencing not only selective values of heritable phenotypic components but also decisions and choices not necessarily conscious ones available to individuals in populations treating extant mammals the primary purpose of the proposed work is to provide new perspectives on common themes in the literature on robustness functional diversity differential resistance to deconstraint of conserved elements and weak robustness the potential to restrict plasticity and evolvability plasticity variation expressed throughout the lifetimes of individuals in a population setting evolvability potential and evolvability non lethal phenotypic novelties induced by endogenous and or exogenous stimuli the proposed project will place particular emphasis upon the adaptive complex in relation to endogenous e g genomes neurophysiology and exogenous abiotic and biotic including social environments organismal features discussed as regulatory and environmental perturbations with the potential to induce and often constrain variability and novelty of form and function

there are nearly 6 000 mammalian species among them our own research on our evolutionary cousins has a long history but the last 20 years have seen particularly rapid progress in disentangling the interrelationships and evolutionary history of mammals the present volume combines up to date reviews on mammalian phylogenetics with paleontological taxonomic and evolutionary chapters and also summarizes the historical development of our insights in mammalian relationships and thus our own place in the tree of life our book places the present biodiversity crisis in context with one in four mammal species threatened by extinction and reviews the distribution and conservation of mammalian diversity across the globe this volume is the introductory tome to the new mammalia series of the handbook of zoology and will be essential reading for mammalogists zoologists and conservationists alike

this book provides a general introduction to the biology of marine mammals and an overview of the adaptations that have permitted mammals to succeed in the marine environment each chapter written by experts in their field will provide an up to date review and present the major discoveries and innovations in the field important technical advances such as satellite telemetry and time depth recorders will be described in boxes

these original contributions on the evolution of primates and the techniques for studying the subject cover an enormous range of material and incorporate the work of specialists from many different fields showing the necessity of a multidisciplinary approach to problems of primate morphology and phylogeny collectively they demonstrate the concerns and methods of leading contemporary workers in this and related fields each contributor shows his way of attacking fundamental problems of evolutionary primatology

vertebrate evolution is studied through comparative anatomy and functional morphology of existing vertebrates as well as fossil records since the publication of the previous edition of colbert s evolution of the vertebrates a history of the backboned animals through time there have been significant advances in the knowledge surrounding backboned animals this latest edition of the classic text is completely revised to offer the most recent discoveries in this continually evolving field of science covering the various aspects of vertebrate life from skeletal system to ecology behavior and physiology the fifth edition includes new sections on conodonts dinosaurs primates and the origin of birds and discusses analysis of morphological and molecular data early diversification of vertebrates the evolution of dinosaurs the origin of mammals early ruling reptiles basic adaptation of ungulates colbert s evolution of the vertebrates fifth edition carries on its legacy as an invaluable reference for professionals in evolutionary biology and paleontology as well as an ideal textbook for students in those fields

the fossil record on mesozoic mammals has expanded by orders of magnitude over the past quarter century new specimens some of them breathtakingly complete have been found in nearly all parts of the globe at a rapid pace coupled with the application of new scientific approaches and techniques these exciting discoveries have led to profound changes in our interpretation of early mammal history mesozoic mammals have come into their own as a rich source of information for evolutionary biology their record of episodic successive radiations speaks to the pace and mode of evolution early mammals were small but they provide key information on the morphological transformations that led to modern mammals including our own lineage of placentalia significant and fast evolving elements of the terrestrial biota for much of the mesozoic early mammals have played an increasingly important role in studies of paleoecology faunal turnover and historical biogeography the record of early mammals occupies center stage for testing molecular evolutionary hypotheses on the timing and sequence of mammalian radiations organized according to phylogeny this book covers all aspects of the anatomy paleobiology and systematics of all early mammalian

groups in addition to the extant mammalian lineages extending back into the mesozoic

mammals range in body size from the gigantic blue whale to the tiny etruscan shrew elephants and man may live for nearly one hundred years while most shrews die before they are three months old during the past decade mammalogists and evolutionary biologists have begun to unravel the numerous factors that shape the enormous diversity of mammal life histories in this volume the authors provide a variety of perspectives on the newest theories in this active field of study the principle uniting all studies of life history evolution is adaptation by natural selection the first chapters in the book discuss this topic offering evolutionary interpretations of geographic variation in mammal life histories explaining how natural selection operates in fluctuating environments introducing evolutionary predictions of demographic mathematics and integrating life histories with behavioral ecology the next chapters offer functional interpretations of the importance of body size in the life history next several essays explain how developments in quantitative genetics have enabled us to distinguish between genetic and environmental components of variation within and between species with this as a basis the chapters that follow draw from principles of natural selection allometry and genetics to interpret differences among species of mammals the book concludes with speculations on various areas where research seems most urgent for the development of a comprehensive understanding of mammal life history evolution according to the authors the field is rich with questions and opportunities abound for both theoretical and empirical research

this book celebrates the contributions of dr frederick s szalay to the field of mammalian evolutionary morphology professor szalay is a strong advocate for biologically and evolutionarily meaningful character analysis he has published about 200 articles six monographs and six books on this subject this book features subjects such as the evolution and adaptation of mammals and provides up to date articles on the evolutionary morphology of a wide range of mammalian groups

the book aims to integrate our understanding of mammalian societies into a novel synthesis that is relevant to behavioural ecologists ecologists and anthropologists it adopts a coherent structure that deals initially with the characteristics and strategies of females before covering those of males cooperative societies and hominid societies it reviews our current understanding both of the structure of societies and of the strategies of individuals it combines coverage of relevant areas of theory with coverage of interspecific comparisons intraspecific comparisons and experiments it explores both evolutionary causes of different traits and their ecological consequences and it integrates research on different groups of mammals with research on primates and humans and attempts to put research on human societies into a broader perspective

from darwin onward it has been second nature for evolutionary biologists to think comparatively because comparisons establish the generality of evolutionary phenomena do large genomes slow down development what lifestyles select for large brains are extinction rates related to body size these are all questions for the comparative method and this book is about how such questions can be answered the first chapter elaborates on suitable questions for the comparative approach and shows how it complements other approaches to problem solving in evolution the second chapter identifies the biological causes of similarity among closely related species for almost any observed character the third chapter discusses methods for reconstructing phylogenetic trees and ancestral character states the fourth chapter sets out to develop statistical tests that will determine whether different characters that exist in discrete states show evidence for correlated evolution chapter 5 turns to comparative analyses of continuously varying characters chapter 6 looks at allometry to exemplify the themes and methods discussed earlier while the last chapter looks to future development of the comparative approach in both molecular and organismic biology

this is a hands on guide for graduate students and young researchers wishing to perfect the practical skills needed for a successful research career by teaching junior scientists to develop effective research habits the book helps to make the experience of graduate study a more efficient and rewarding one the authors have taught a graduate course on the topics covered for many years and provide a sample curriculum for instructors in graduate schools wanting to teach a similar course topics covered include choosing a research topic department and advisor making workplans the ethics of research using scientific literature perfecting oral and written communication publishing papers writing proposals managing time effectively and planning a scientific career and applying for jobs in research and industry the wealth of advice is invaluable to students junior researchers and mentors in all fields of science engineering and the humanities

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