

PREFACE

This is a state of the art reference book about fossil insular mammals. It provides an extensive overview of what is known about their evolution, adaptation and extinction. Fossil insular mammals often show remarkable and sometimes even bizarre adaptations, such as dwarfism and gigantism. Understanding the processes underlying these adaptations helps us to understand the patterns of evolution, not only those on islands, but also those on the mainland and in fragmented habitats.

Many important studies describe the biogeography and ecology of extant insular mammals, but similar works on extinct insular mammals are few. Although the number of such studies is increasing, the information on individual taxa and islands is scattered over many journals, often not widely available, or information on the subject is limited to a few paragraphs in books. This long-awaited book offers a timely synthesis of available extant studies. Our overview of fossil insular faunas offers an updated approach to the subject and elaborates on published studies – excellent as some of these in many respects are. We have designed this book as a synthesis of available data somewhat less formal than research papers or systematic revisions. In this way it will be of use to the many researchers, regardless of speciality, who need a source of data and interpretations about fossil insular mammals, as well as qualified graduate students in palaeontology, zoology, evolutionary biology and biogeography.

Why is an up-to-date overview of fossil insular mammals important? Our knowledge of island biogeography, ecology and evolution is limited because it is mainly on present-day patterns of biodiversity on islands and in fragmented habitats. The main limitation of this approach is that the available sources are by definition restricted to very short and recent periods of time. To analyse similar biogeographical patterns that developed over time spans of thousands or even millions of years, fossil data need to be part of our studies.

By ignoring the fact that biodiversity on islands was much greater in the past than it is today and by only taking into account present-day biodiversity on islands, an impoverished, unbalanced view of island biogeography may come into being. For example, the megafauna of Madagascar contained large taxa, such as hippos and giant lemurs, which are all extinct

now. This means that the average body mass of Malagasy taxa is lower now than during the Late Pleistocene. Furthermore, because of the effects of time, the resulting speciation differs much from what is seen today. Where present-day island taxa often are not smaller than roughly 80% of their mainland ancestor, fossil insular taxa sometimes reduced their body mass to a mere 1%, as in the case of the pygmy elephant of Sicily (*Elephas falconeri*). As a result, islands of today provide a poor example of evolution on islands.

The fossil record of the supercontinental islands Australia and South America is excluded from our synthesis. The reason is that their fossil faunas represent balanced or harmonic faunas, thus containing a representative number of elements pertaining to all orders typical for the geographical latitude and altitude, with representatives of all trophic levels. In fact, these mega-islands are more similar to continents than to islands. Their long-term isolation resulted in endemic balanced faunas with their own stamp, not comparable to the endemic faunas we describe in this book. The inclusion of Australia and South America would lead to yet another book on general vertebrate palaeontology. In order to keep the scope of the book more focused, we excluded these supercontinental islands and restricted ourselves to placental mammals.

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