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Preface to *Biology of the Heteromyidae*

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PREFACE

What is the family Heteromyidae? It is the group of exclusively New World rodents that includes the kangaroo rats, pocket mice, and kangaroo mice of the desert, grasslands, and shrublands of western North America as well as the spiny and pouched rats of the subtropical shrublands and tropical deciduous and evergreen forests of North America, Central America, and northernmost South America. It is a large family, with six genera and 316 species.

Why are these rodents interesting enough to warrant an entire book to review what is known about their biology? The first and most important reason is because heteromyids have served as model organisms for many kinds of biological studies. In their adaptive radiation to colonize diverse temperate and tropical environments, they have acquired specialized morphological, physiological, and behavioral characteristics. In their evolutionary diversification in heterogeneous landscapes, they provide examples of genetic, ecological, and biogeographic processes that have played key roles in speciation and differentiation. In their ecological responses to spatially and temporally varying environments, they offer insights into the mechanisms that control population dynamics and determine community composition. Studies of heteromyid rodents have made seminal contributions to comparative biology, and most of these important discoveries are reviewed in this volume.

A second reason for this review is to synthesize the available information on all aspects of heteromyid biology. Much of what is known about heteromyids was learned by specialists, who elected to study particular species that offered a "good system" for addressing questions in disciplines such as renal physiology, cytogenetics, biomechanics, or community ecology. As important as these studies have been, it is easy to lose sight of the fact that they all describe attributes of living species that make a living in real environments. This book attempts not only to review what is known about heteroymid biology, it also tries to synthesize this information to provide a more integrated view of the lives of these interesting rodents.

A final reason to review the biology of heteromyids is because these special animals deserve a wider audience. Although these rodents have been discovered by many comparative biologists seeking to answer diverse questions, they remain largely unappreciated. Heteromyids belie the stereotypes usually associated with the terms rats and mice. For the most part they are clean, beautiful, and mild-tempered. They live in some of the wildest and most scenic regions of the Western Hemisphere. They have the potential to continue to serve as model systems and to allow researchers to address important new questions. By pointing out

what is still unknown, as well as what is known, this book may serve to attract new scientists to the ranks of those who love these rodents for their own sakes as well as for their possibilities for contributing to new discoveries.

The idea to produce this volume began several years ago. The publication in 1968 of an influential volume on *Peromyscus* (American Society of Mammalogists Special Publication No. 2) showed the value of reviewing and synthesizing information on particular taxonomic groups of mammals that have been the subject of much research. With the success of a volume on New World *Microtus* (Special Publication No. 8; 1985), mammalogists who worked on heteromyid rodents began to talk about the desirability of producing a Special Publication devoted to their biology. Making an entire family the subject of this volume obviously represents broader coverage than the previous volumes devoted to single genera of New World rodents. This book is able to call attention to the spectacular diversity of form, function, and environmental relationships that has resulted from the adaptive radiation of the Heteromyidae.

We wish to thank all those individuals who contributed to the production of this volume. Many of these people are acknowledged by the authors in their chapters. In addition to these individuals, we first thank the authors of the chapters for their efforts to prepare broad, careful, authoritative reviews. We appreciate their patience with the delays in publication and their willingness to update their chapters to keep the information current. Second, we thank all those individuals who have improved this volume by preparing constructively critical reviews of early drafts of the chapters. We are especially grateful to R. J. Baker, A. D. Barnosky, S. Berman, M. A. Bowers, J. S. Brown, M. D. Carleton, J. F. Eisenberg, M. D. Engstrom, D. J. Hafner, J. C. Hafner, M. S. Hafner, D. S. Hinds, M. L. Kennedy, B. P. Kotler, R. T. M'Closkey, M. A. Mares, J. E. Martin, J. C. Munger, C. J. Phillips, W. B. Quay, J. A. Randall, O. J. Reichman, V. Sarich, D. A. Schlitter, D. O. Straney, R. M. Sullivan, R. M. Timm, and S. D. Webb, who prepared careful reviews for the editors. Third, we thank David I. Rasmussen, who has enlivened this book with delightful sketches that capture both the attractiveness of heteromyids and interesting features of their biology. Finally, we thank the many members, officers, and editors of the American Society of Mammalogists for their support of this volume and their contributions to its production. We are especially grateful to Michael A. Mares, Editor for Special Publications, and Don E. Wilson and Craig S. Hood, Managing Editors for Mammalian Species and Special Publications, for their work in preparing the final manuscript for the press.

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