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Caviomorph rodent social systems: an introduction

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This Special Feature highlights the diversity of social systems in the South American caviomorph (New World hystricognath) rodents. It includes 3 single-species accounts, 2 reviews of broad taxomomic groups, and 2 synthetic reviews with suggestions for directions for future research.

Key words: caviomorphs, mating systems, sociality

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The South American caviomorphs (New World hystricognaths) are a diverse group of rodents (14 extant families—Honeycutt et al. 2003). Caviomorph rodents can be found in most habitats, including high- and low-altitude shrublands, coastal areas, and tropical forests, with numerous species having wide geographical ranges. Habitats range from arboreal to semiaquatic to subterranean. This diversity makes caviomorphs ideal species for interspecific and intraspecific comparisons of social systems. However, until recently, relatively little was known about caviomorph rodent sociality, making it difficult to make generalizations about the evolution of sociality in rodents (Ebensperger 1998). Thus, some researchers (Ebensperger 1998; Tang-Martínez 2003) have called for research describing the social systems of more species and the examination of causes and consequences of social variation in well-studied species (e.g., *Octodon degus*).

Since the late 1990s researchers have described the sociality of numerous caviomorph species and have begun testing novel hypotheses in the field and laboratory. The objectives of this Special Feature are to present some of these advances and demonstrate the utility of caviomorphs as model organisms for research on sociality. Most important, this Special Feature, we hope, will stimulate new directions in research and promote the development of integrative models for caviomorph rodent sociality.

This Special Feature consists of 7 papers, with topics including a new report of sociality, a field test of an ecological constraints hypothesis, and several synthetic reviews. The 1st paper, by Santos and Lacey (2011), reports evidence of burrow sharing in the torch-tail spiny rat (*Trinomys yonenagae*), a desert species whose sociality has yet to be described. The authors discuss their observations in an ecological context and make comparisons with forest echimyid rodents and desert rodents. In the 2nd paper Herrera and colleagues (2011) review the social structure and dynamics of capybaras (*Hydrochoerus hydrochaeris*) and their variation in time and space. Capybaras live in stable social groups throughout most of their geographical range. Group sizes appear to be linked to local population density, leading the authors to infer ecological constraints on sociality. In the 3rd paper Ebensperger and colleagues (2011) assess the impact of burrow availability, an ecological constraint, on sociality of degus (*O. degus*). They report that availability of burrows and population density are not linked and that degu social groups are unaffected by population density. Together, these results suggest that ecological constraints alone do not explain adequately the evolution of degu sociality.

The next 2 papers are reviews of social systems of 2 broad taxonomic groups, echimyid rodents (Adler 2011) and cavies (Adrian and Sachser 2011). Adler reports that social mating systems of echimyid rodents range from monogamy to polygyny, and he develops a model to predict such systems. Adrian and Sachser report similarly diverse social and mating systems in 4 cavy genera (*Cavia*, *Galea*, *Microcavia*, and *Kerodon*). They discuss behavioral strategies and environmental factors that may explain the diversity of social systems and adaptations in reproductive physiology to different systems.

The last 2 papers of the Special Feature are broad reviews that include recommendations for future research. Maher and Burger (2011) examine the extent of intraspecific variation in

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space use, group size, and mating systems of caviomorph rodents. Their review reveals the general trend that caviomorph social organization fits the predictions of resource-based models. The Special Feature concludes with a paper by Hayes et al. (2011) describing our current understanding and future directions of study in 4 research foci (brain mechanisms, behavioral endocrinology, fitness consequences, and disease ecology). Hayes and colleagues emphasize the importance of developing integrative models for caviomorph rodent sociality.

Resumen

Esta selección especial de artículos ilustra la diversidad de sistemas sociales que caracteriza a los roedores caviomorfos sudamericanos (histricoñatos del Nuevo Mundo). Tres de los artículos corresponden estudios de casos a especies distintas, 2 corresponden a revisiones taxonomicamente amplias, y otros 2 a revisiones de síntesis con sugerencias de investigaciones futuras.

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