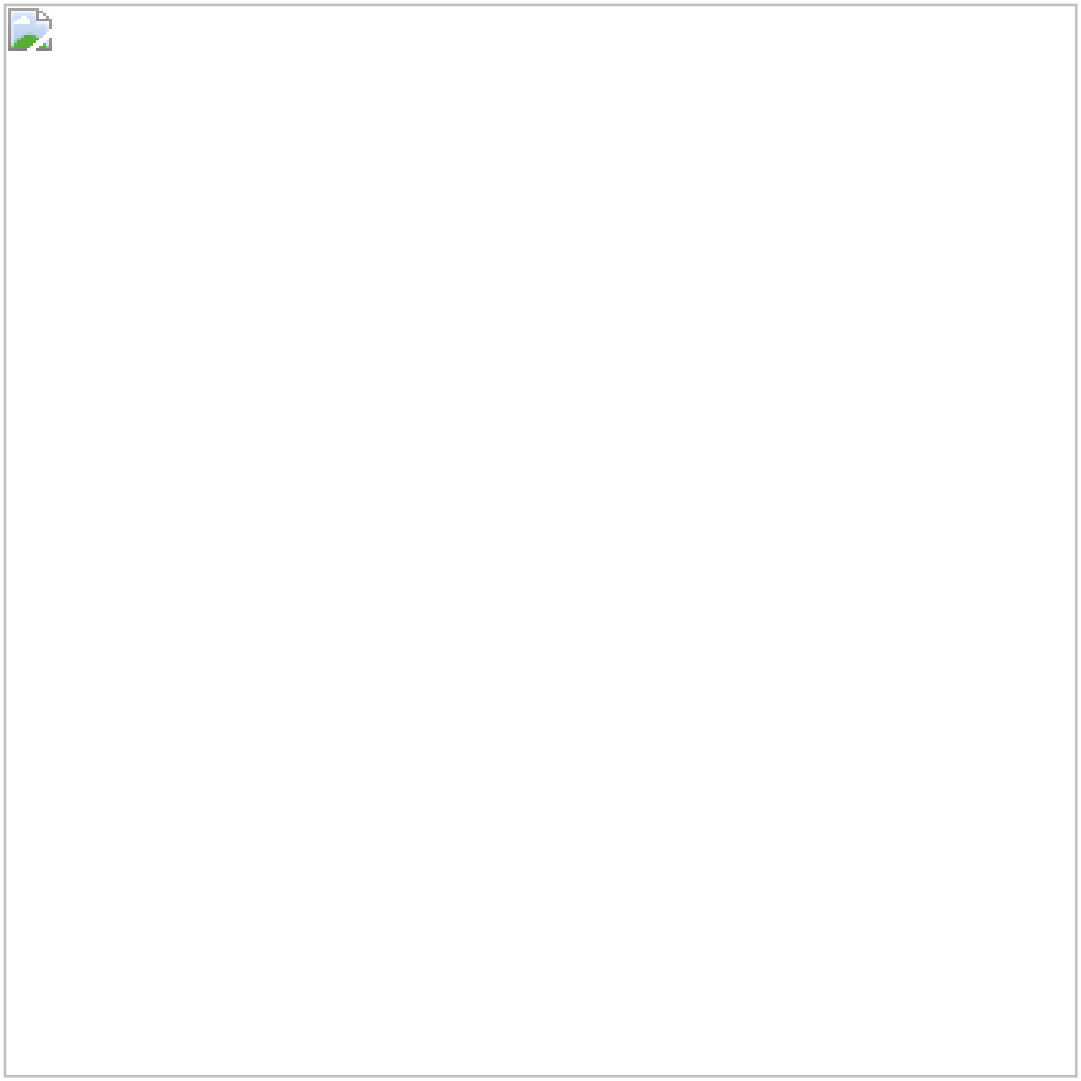

Mammals of South America. Volume 2: Rodents

Authors: Pérez, María Encarnación, and Upham, Nathan S.

Source: Ameghiniana, 53(4) : 523-525

Published By: Asociación Paleontológica Argentina

URL: https://doi.org/10.5710/AMGH.v53i4.1

ISSN 0002-7014

AMEGHINIANA - 2016 - Volume 53 (4): 523 – 525 BOOK REVIEWS

MAMMALS OF SOUTH AMERICA. VOLUME 2: RODENTS. Edited by *James L. Patton, Ulyses F. J. Pardiñas, and Guillermo D'Elía*. 2015, xxvi + 1336 pp. The University of Chicago Press, USA. ISBN-13: 978-0-226-16957-6 (Hardbound US $95).

This monumental volume edited by James L. Patton, Ulyses F. J. Pardiñas, and Guillermo D'Elía, and with the contribution of more than fifty specialists in the study of Neotropical mammals, is a vital update to our knowledge of South America's rodent fauna–the most diverse order of living mammals on the continent. This fascinating and exceedingly thorough systematic revision encompasses all extant rodent taxa (not extinct or introduced species) distributed in South America and on the continental plate, including the islands of Trinidad and Tobago, Aruba, Curaçao, and Bonaire off the Caribbean coast of Venezuela, in addition to annexed islands such as the Galápagos. Hence, this second installment in the *Mammals of South America* series keeps with the inaugural volume on marsupials, xenarthrans, shrews, and bats (2007 [2008]; edited by A. L. Gardner) in having a scope that is geographic rather than inclusive to monophyletic clades.

The endeavor to systematically evaluate mammalian diversity across "the vast terrain between Panama and Tierra del Fuego," as stated on the jacket cover to volume 1, is an ambitious and necessary task, and especially so for the speciose Rodentia. At nearly twice the length of its predecessor, *Volume 2: Rodents* contains individual taxonomic accounts for 643 species–a remarkable feat and near-doubling from the 341 rodent species known in Cabrera's (1961) *Catálogo de los mamíferos de America del Sur*. The high rate of mammalian species discovery in the Neotropics has only continued during the decade since the taxonomic compendia of Wilson and Reeder (2005) and IUCN (2008) appeared, including many new or refined species of South American rodents (summarized in Table 1).

The well-written Introduction to *Volume 2* identifies several key factors that have spurred these advances in systematic research in South America, including new molecular technology (*e.g.,* DNA sequencing, karyology), computer-driven methodologies to evaluate characters and construct phylogenies, intensive field research in the remotest areas of the continent, and governmental support to train zoologists and establish research infrastructure in South American countries.

This book consists of six major sections overall, with the core systematic contributions being located in the Taxonomic Accounts (p. 1–1048) and Gazetteer (p. 1209–1276) sections. The authors of each account provide comprehensive revisions for all species and higher taxa of South American rodents, including extensive synonymic lists, full identification keys, literature reviews, detailed external descriptions, and natural history information. These details are provided for each order, family, genus, and species, as well as the intermediate groupings of sub- and infraorder, super- and subfamily, tribe, and subspecies where applicable. Karyotypes of species are listed in the remarks section when known (~60% of species), which invaluably serves to centralize a widely scattered body of information. The gazetteer of species localities at the end of the volume represents a spectacular amount of detailed work on behalf of the editors and authors. It lists a total of 4504 individual localities spread across 15 countries, every one of them tied to georeferenced coordinates in a standardized decimal degrees format, and including meters above sea level where > 0.

Range maps of the per-species occurrences at gazetteer localities consequently form a central component of the species-level taxonomic accounts, so that each map offers a robust summary of vetted locality data – usually tied directly to museum vouchers. Another (not obvious) value of each map is that the inset box shows (i) how a species distribution is related to the broader genus-level distribution of which it is part; and (ii) a zoom-in box showing the focal area of South America for the primary species-level map. Thus, each range map offers a high quality starting point for future workers on the geographical diversity and diversification of these rodents. While the editors remind users of biodiversity metadata "not to confuse a shaded range

bounding locality records with actual occurrence throughout," we note that if these range maps were digitized and distributed they would nevertheless improve upon the widely-used expert range maps of IUCN for these species.

The Taxonomic Accounts section is organized into treatments of extant taxa in the suborders Sciuromorpha (p. 1–47), Castorimorpha (p. 48–57), Myomorpha (p. 58–687), and Hystricomorpha (p. 688–1048). Comparing those page treatments to the respective levels of taxonomic diversity in each suborder (Table 1) is itself a revealing exercise, showing that more pages were devoted to Sciuromorpha per species (2.5) than to others (1.4, 1.6, and 1.5, respectively). Justifying that greater allotment is a doubling to the number of species recognized in *Microsciurus* (8 vs. 4), division of *Sciurus* into four genera (*Guerlinguetus*, *Hadrosciurus, Notosciurus*, and *Simosciurus*), and recognition of the Peruvian montane squirrel (*Syntheosciurus* sp.) for the first time. From the last dedicated revision of South American members of Sciuridae by Allen in 1915, this section represents a major and long overdue update to an understudied area of rodent biodiversity–one that deserves attention from molecular systematists to untangle further. The castorimorph lineage, while a relatively minor contributor to rodent diversity in northern South America, includes a valuable summary of recent progress in the systematics and geographic distribution of six *Heteromys* and the lone pocket gopher of the Colombian Chocó.

The largest section belongs to Cricetidae, the only family of Muroidea (Myomorpha) represented in South America, and extends around 630 pages, tallying 22 more species and 15 more genera in South America than did Wilson and Reeder (2005). The three subfamilies of South American cricetids are exhaustively treated, however Sigmodontinae (p. 63–687) encompasses by far the majority of this group with 381 species documented. This segment is introduced with an extraordinary summary of knowledge about these taxonomically and ecologically diverse rodents, including information regarding distribution areas, biogeography, environmental and habitat preferences, alpha taxonomy, and phylogenetic relationships within the sigmodontines.

Within Hystricomorpha, the New World Hystricognathi treatment is divided into the four traditional superfamilies Cavioidea, Chinchilloidea, Erethizontoidea, and Octodontoidea. The evolutionary history of these four major clades, including a summary of their extensive fossil record and family-level phylogenetic relationships are provided in each subsection. Octodontoidea (p. 805–1048), the most speciose group of rodents in this suborder, is composed here by Abrocomidae, Echimyidae, Ctenomyidae, and Octodontidae (plus the Antillean Capromyidae, which is untreated here). That delimitation follows recent molecular phylogenetic analyses, but contrasts with the morphological and paleontological view of Echimyidae as paraphyletic with respect to other groups (*e.g.* Myocastoridae, "†Adelphomyinae") and Ctenomyidae as a subfamily within Octodontidae.

Additional sections include the List of Taxa (p. 1277–1286), a useful reference consisting of both scientific and English common names arranged in full taxonomic order, and an exceptionally complete Literature Cited section (p. 1049–1208) that ought to be a humbling experience for any mammalogist to thumb through. The list of Contributors (p. 1287–1290) includes the mailing and email addresses of the volume's 55 authors, nearly two-thirds of which hail from South American countries. Finally, the Index (p. 1291–1336) includes all taxonomic names discussed in the text, with page numbers for all mentioned synonyms too.

The impressive nature of *Volume 2: Rodents* is difficult to overstate for its breadth and depth of coverage, scholarly acuity, and the amount of thoroughgoing hard work required to bring it from conception to creation. Three decades of collective effort on this task (work began in earnest in 1987!) was not, however, singularly motivated by the goal of a book series, but rather inspired by the far-reaching view of mammal systematics as an integrative science that in order to mature would require accurate documentation of the now over 250-years of biodiversity research on the South American continent. We can all thank the editors and authors of this Mammals of South America series for lighting another torch that illuminates our gaps of ignorance and grows our collective knowledge.

María Encarnación Pérez
Museo Paleontológico Egidio Feruglio
mperez@mef.org.ar

Nathan S. Upham
Yale University
nathan.upham@yale.edu

Table 1 – Diversity of South American rodent species (and genera) as given in the compendia of Mammals of South America vol. 2 (MSA2) and equivalent values from Mammals Species of the World vol. 3 (MSW3).

Clade	*MSA2 (2015)*	*MSW3 (2005)*
SCIUROMORPHA*		
Sciuridae*	*19 (7)*	*16 (3)*
CASTORIMORPHA*	*7 (2)*	*6 (2)*
Geomyidae*	*1 (1)*	*1 (1)*
Heteromyidae*	*6 (1)*	*5 (1)*
MYOMORPHA*		
Cricetidae*	*384 (88)*	*361 (73)*
Neotominae*	*2 (2)*	*2 (2)*
Sigmodontinae*	*381 (85)*	*358 (70)*
incertae sedis	*21 (12)*	*18 (11)*
Abrotrichini	*13 (5)*	*15 (5)*
Akodontini	*85 (15)*	*91 (14)*
Ichthyomyini	*13 (4)*	*12 (4)*
Oryzomyini*	*119 (30)*	*112 (17)*
Phyllotini	*51 (11)*	*45 (11)*
Reithrodontini*	*2 (1)*	*2 (1)*
Sigmodontini*	*4 (1)*	*4 (1)*
Thomasomyini	*71 (5)*	*58 (5)*
Wiedomyini	*2 (1)*	*1 (1)*
Tylomyinae*	*1 (1)*	*1 (1)*
HYSTRICOMORPHA*	*233 (46)*	*222 (47)*
Cavioidea*	*34 (9)*	*32 (9)*
Caviidae	*20 (6)*	*18 (6)*
Cuniculidae	*2 (1)*	*2 (1)*
Dasyproctidae*	*12 (2)*	*12 (2)*
Chinchilloidea	*8 (4)*	*7 (4)*
Chinchillidae	*7 (3)*	*6 (3)*
Dinomyidae	*1 (1)*	*1 (1)*
Erethizontoidea*		
Erethizontidae*	*14 (2)*	*15 (4)*
Octodontoidea*	*177 (31)*	*168 (30)*
Abrocomidae	*10 (2)*	*10 (2)*
Ctenomyidae	*65 (1)*	*60 (1)*
Echimyidae	*88 (22)*	*84 (18)*
Myocastoridae	*n/a*	*1 (1)*
Octodontidae	*14 (6)*	*13 (8)*
TOTAL	*643 (143)*	*605 (125)*

Sigmodontine tribes for MSW3 are based on the MSA2 genus assignments.
Taxa with asterisks contain additional species distributed entirely outside of South America.