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A new acaremyid rodent (Hystricognathi: Octodontoidea) from the middle Miocene of Patagonia (South America) and considerations on the early evolution of Octodontoidea

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Abstract

Octodontoidea is the most speciose and ecologically diverse superfamily of caviomorph rodents. The systematic relationships of modern octodontoids is moderately accepted, however, the relationships of fossils (from the Eocene?–middle Miocene) are not clear. In recent years the hypothesis of a complex early evolution of the superfamily has emerged, with "basal octodontoids" representing different evolutionary lineages. The extinct family Acaremyidae may represent one such lineage, consisting of the genera *Acaremys, Sciamys*, *Galileomys*, and variably *Platypittamys*. In this work we describe a new octodontoid rodent recorded in post-Colloncuran? levels exposed at the locality of El Petiso, Northwest of Chubut Province, Argentina. Based on a systematic analysis of dental characters, we conclude that the new specimens correspond to a new species of *Sciamys*. Additionally, if the post-Colloncuran age for El Petiso is verified, the new species will extend the temporal range of the family Acaremyidae until, at least, the late middle Miocene, as well as the temporal range for the genus *Sciamys* from the Santacrucian SALMA. Our phylogenetic analyses corroborate the position of the new species as a member of *Sciamys*, and confirm that Acaremyidae represents an extinct family from Patagonian South America that lived until the middle Miocene. *Massoiamys obliquus* qualifies as morphological ancestor that pre-announces the octodontiform tooth pattern of octodontids. Thus, the octodontiform tooth pattern appears at least twice within the superfamily Octodontoidea.

Key words: Octodontoidea, Acaremyidae, phylogeny, Patagonia, middle Miocene

Introduction

The rodent clade Caviomorpha includes all hystricognath rodents that are endemic to the Neotropics, of which Octodontoidea is the most diverse superfamily (Reig 1989; Huchon & Douzery 2001). Extant octodontoids are traditionally grouped into Octodontidae, (including Ctenomyinae), Echimyidae, Myocastoridae, Abrocomidae, and Capromyidae (Simpson 1945; Huchon & Douzery 2001). Octodontids and echimyids are the most diverse and widespread octodontoids, occupying and exploiting most habitats in South America. Octodontidae is composed of octodontines (degus, rock rats, etc.) that inhabit arid and open regions from Peru to southern Patagonia, and ctenomyines (tuco-tucos) that inhabit a wider distribution but are primarily fossorial. Echimyidae (spiny rats, bamboo rats, etc.) inhabits tropical rainforest, savannas, thorn scrub, montane rainforest, and woodlands from Nicaragua to Northern Argentina and includes scansorial, arboreal, semifossorial and semiaquatic taxa (Ellerman 1940).

Although the systematic relationships of modern octodontoids are moderately accepted (Woods 1984; Huchon & Douzery 2001; Rowe *et al.* 2010), the relationships of "basal octodontoids" (i.e. those of Eocene?–middle Miocene faunas) are not clear, even though they have been widely studied (Ameghino 1887, 1889, 1902; Scott 1905; Wood 1949; Wood & Patterson 1959; Patterson & Pascual 1968; Patterson & Wood 1982; Vucetich & Kramarz 2003; Frailey & Campbell 2004; Vucetich *et al*. 2010a, b). Traditionally, the history of this superfamily

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