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Phylogenetic and biogeographic relationships of gerbil mice *Eligmodontia* (Rodentia, Cricetidae) in South America, with a description of a new species

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Abstract

We present a systematic study of the genus *Eligmodontia* (sigmodontine rodents of the tribe Phyllotini) from Argentina, Bolivia, and Chile, based on molecular data. Phylogenetic relationships among 49 individuals were examined using nucleotide sequence data from the entire 1143 bp of the mitochondrial cytochrome-*b* gene. Unweighted parsimony, minimum evolution, maximum-likelihood (TrN+I+G), and Bayesian analyses revealed 2 major clades, representing Andean and non-Andean groups, and 6 minor clades, representing *E. typus* (lowland), *E. typus* (highland), *E. morgani*, *E. puerulus*, *E. moreni*, and *E. hirtipes*. *E. typus* (highland) is described as a new species based on combined data from the cytochrome-*b* gene, morphology, and karyology. The results indicate that the genus *Eligmodontia* is composed of a complex of species, most of which correspond to taxa that were described originally and each of which shows molecular cohesion within a limited geographic range. This species complex has relevance to current theories regarding the speciation patterns and the historical biogeography of South American sigmodontine rodents. The biogeographic history of the genus also is outlined.

Key words: biogeography, cytochrome *b*, *Eligmodontia*, gerbil mice, phylogeny, South America, Sigmodontinae, systematics, taxonomy

Introduction

Gerbil mice, genus *Eligmodontia* F. Cuvier, are small xerophytic rodents that inhabit arid and semi-arid habitats on the South American continent, including the grasslands and scrublands of Patagonia, the Monte Desert, the Espinal, and the dry grasslands, scrublands, and puna habitats of the high Andes. The distribution of *Eligmodontia* extends from extreme southern Perú, western Bolivia, northern Chile and northwestern Argentina, south to southern Argentina and Chile (Fig. 1; Hershkovitz 1962; Musser & Carleton 2005). The altitudinal range is broad, ranging from sea level in the southern latitudes to more than 4500 m in the northern latitudes.

The genus is clearly allied with members of the tribe Phyllotini (leaf-eared mice) based on analyses of morphologic and molecular data (e.g., Braun 1993; Smith & Patton 1999; Steppan 1993, 1995; Steppan *et al.* 2004). This diverse tribe is comprised of 13 genera, 6 of which are monotypic, and about 47 species (Anderson & Yates 2000; Braun & Mares 1995; Musser & Carleton 2005; Steppan 1995), with the differences a reflection of changes in taxonomy and the description of new taxa. Monophyly of the genus is well supported by, among other characters, elongate hind feet, soles that lack a hypothenar plantar tubercle, and the fusion of the 2nd, 3rd, and 4th plantar tubercles into a hairy cushion (Braun 1993; Steppan 1995).

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