Article

Genetic evaluation of the Baja California rock squirrel *Otospermophilus atricapillus* (Rodentia: Sciuridae)

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Abstract

The Baja California rock squirrel (*Otospermophilus atricapillus* Bryant) is endemic to the Baja California Peninsula, Mexico and known from only five localities. *O. atricapillus* is considered as the sister species of *O. beecheyi* (Richardson) and both have been considered different species mainly by its colorations. In an attempt to better understand the relationship within *O. atricapillus* and with its sister species *O. beecheyi*, we used genetic information gathered from *O. atricapillus*, aiming to investigate the phylogenetic and phylogeography of *O. atricapillus - O. beecheyi*. We analyzed two sets of mitochondrial cytochrome *b* gene (Cyt *b*) data: One 800 (bp) fragments of 118 individuals and a second one of 1140 (bp) for the 32 haplotypes found. Our own hypothesis is that specific characteristics used to distinguish *O. artricapillus* from *O. beecheyi* are at the same level than the differences among the recognized subspecies of *O beecheyi*. Under that condition, a genetic analysis will show that *O. atricapillus* are within the genetic variation of *O. beecheyi*, and the current diagnostic characters of *O. atricapillus* could be considered only at subspecific level. The analysis of molecular variance revealed that *O. atricapillus* is not significantly different from *O. beecheyi,* and that, apart from highland populations in the Sierra Nevada, the sampled populations of *O. beecheyi* and *O. atricapillus* are not significantly different among all of them.

Keywords: cytochrome *b,* México, genetic variation, *Otospermophilus,* Rodentia, *Spermophilus,* taxonomic

Introduction

Two species of ground squirrels of the genus *Otospermophilus* are currently recognized (e.g., Thorington & Hoffmann, 2005) in the Southern Pacific Coast of North America: the California ground squirrel (*Otospermophilus beecheyi* Richardson) ranges north of 29°N, with records in Baja California (Mexico), California, Oregon, Washington, and in a small area in northwestern Utah (United States), while and the Baja California rock squirrel (*O. atricapillus* Bryant) occurs south of 28°N in the Baja California Peninsula (Mexico), with records from only five localities in the Sierra de San Francisco-Santa Marta, Sierra de La Giganta, and La Purísima region (Álvarez-Castañeda *et al.,* 1996; Yensen & Valdés-Alarcon, 1999). *O. atricapillus* is uncommon across the Baja California Peninsula, where it is found in areas with black basalt rock and mesic habitats (Álvarez-Castañeda *et al.*, 1996; Yensen & Valdés-Alarcon, 1999), and associated with a variety of Sonoran desert vegetation with a high diversity of co-dominant life forms (Peinado *et al.*, 1994). On the other hand, *O. beecheyi* is a common inhabitant of grasslands, meadow-woodland complexes, agricultural areas, and woodlands at lower elevations from central Washington to the state of Baja California (Hubbart, 2001). *O. beecheyi* is also found in the California highlands, in areas of mixed conifer forest; squirrel nests are associated with *Pinus ponderosa* (ponderosa pine) and *Abies concolor* (white fir) that prevail at mid elevations (Schoenherr, 1992).

The Baja California rock squirrel *O. atricapillus* is recognized as distinct species from *O. beecheyi* because of its distinctive external morphology, especially its dark face, which is used as a diagnostic feature (Howell, 1938; Hall, 1981; Yensen & Valdés-Alarcon, 1999; Hubbart, 2001; Helgen *et al.,* 2009). Observations during several years of field research (Álvarez-Castañeda, personal observation), however, have shown substantial variation in coat color among individuals of *O. atricapillus* in Comondú, its type locality, and in the San Pedro de la Presa