



## On the species identities of a complex *Liolaemus* fauna from the Altiplano and Atacama Desert: insights on *Liolaemus stolzmanni*, *L. reichei*, *L. jamesi pachecoi*, and *L. poconchilensis* (Squamata: Liolaemidae)

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### Abstract

The South American lizard genus *Liolaemus* has undergone a complex adaptive radiation that has resulted in the evolution of more than 200 species widely spread in an extraordinary diversity of environments, and forming a complex array of assemblages. This evolutionary complexity has puzzled systematists and taxonomists since the first species were described more than 150 years ago. Within this lineage, the Andean *Liolaemus* faunas have proven to be a major challenge for herpetologists. Therefore, intense research is needed in this area to clarify long-standing problems. After more than a century of taxonomic confusion, the identity of *Liolaemus stolzmanni* (Steindachner, 1891) is here restored as the name that must be applied to the lizards widely known as *Phrynosaura* (= *Liolaemus*) *reichei* Werner, 1907 from the low to mid-elevation deserts of Tarapacá, Chile. Since 1966, the name *L. stolzmanni* has been erroneously assigned to populations of *Liolaemus* from the high Andes of the Chile-Bolivia borderlands which, according to observations presented in this study, correspond to *Liolaemus pachecoi* Laurent, 1995. A lectotype and allotype for *L. stolzmanni* are designated and the type locality for *L. stolzmanni* (= *L. reichei*) is emended to “Deserts of Iquique, Tarapacá Region, Chile”. Furthermore, the recognition of *L. pachecoi* as a species distinct from *L. jamesi* is supported by mtDNA sequence divergence data despite the inconclusive meristic and morphometric data. In summary, I conclude that (i) the Chilean *L. reichei* is a synonym of *L. stolzmanni*, and hence, that *L. stolzmanni* is a species endemic to Chile, not an element of the fauna of present-day Peru and that (ii) the Chilean Altiplano populations currently recognized as *L. stolzmanni* are *L. pachecoi*, a species hitherto known only from Bolivia. Also, I report the first confirmed specimens of *L. poconchilensis* from Peru, a species previously known only from Chile and confused with *L. reichei*.

**Key words:** Lizards, Chile, Peru, Bolivia, Andes, taxonomy, *Phrynosaura*, *Ctenoblepharys*

### Introduction

With over 220 described species, the South American lizard genus *Liolaemus* is the second most speciose amniote genus, exceeded only by the iguanian genus *Anolis* from tropical America and the Caribbean. During their evolutionary history, *Liolaemus* have extensively colonized an extraordinary diversity of environments (Espinoza *et al.*, 2004; Pincheira-Donoso *et al.*, 2008a) that have forced the evolution of a remarkable diversity of morphologies and behaviors (Schulte *et al.*, 2004; Pincheira-Donoso *et al.*, 2009). This extraordinary diversification within the genus has resulted in a substantial challenge for *Liolaemus* specialists aiming to identify and name these species and major-level groups (Etheridge & Espinoza, 2000). Part of the long-standing nomenclatural controversies within the genus *Liolaemus* has resulted from difficulties faced by modern herpetologists to access the original type series of specimens that served as the basis for species descriptions during the XIX century.

One case of long-standing confusion involves the identities of a number of *Liolaemus* species widespread in the Altiplano (High Andes Plateau) of Argentina, Bolivia, Chile and Peru, and the adjacent lower areas of the Atacama desert in northern Chile and southern Peru. In this area, several nomenclatural problems have been discussed in recent syntheses (e.g. Etheridge & Espinoza, 2000; Valladares *et al.*, 2002; Pincheira-Donoso *et al.*, 2008b), and several species have only recently been recognized as a result of historical difficulties for field explorations, isolation of areas, and climatic constraints. Therefore, much more systematic and geographical research is needed in this