



<http://dx.doi.org/10.11646/zootaxa.3887.4.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:06CD5DE9-10BE-4DFF-8E5E-FD27808DA6E7>

A new species of *Psychrophrynella* (Anura: Craugastoridae) from the Cordillera Real, Department La Paz, Bolivia

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Abstract

We describe a new species of *Psychrophrynella* from a single locality in the Cordillera Real, in the Andes of Department of La Paz, Bolivia. *Psychrophrynella teqta* sp. nov. is highly variable in color pattern and differs from the species geographically closer mostly by presenting yellow or red blotches, usually absent in other species. In addition, the new species differs from all species in the genus because the males have a pulsed call. Males of this species show parental care, and the high number of eggs per nest suggest that perhaps more than one clutch might be attended by a single male. As other species in the genus, the new species is infected by *Batrachochytrium dendrobatidis*, and thus, a conservation threat is already present upon its discovery.

Key words: Amphibia, Andes, Bd, bioacoustics, parental care

Introduction

Members of the genus *Psychrophrynella* represent a remarkable radiation of small direct-developing frogs inhabiting the upper cloud forests, elfin forests, and wet subparamos of the Cordillera Oriental of the Andes from southern Peru to central Bolivia (Frost 2014). Similar patterns of radiation are represented in central and southern Peru by the genera *Phrynopus* and *Bryophryne*, respectively. The most striking feature of these groups is the high beta-diversity and the limited distributions of species, which are usually known only from the type locality and, in rare cases, some other places nearby (De la Riva 2007). All species described occur in the Amazonian versants of the Andean Cordillera Oriental, and they are not found in the more xeric valleys facing the puna grasslands of the Altiplano basin. The number of new species increases steadily as previously unexplored areas are surveyed, and the actual number of species is still far from being known (De la Riva & Reichle 2014). While until now only three species of *Psychrophrynella* have been described for Peru (but there are several others in collections awaiting description; De la Riva *et al.* unpubl.), Bolivia holds a much richer *Psychrophrynella* fauna, with 17 species described hitherto. Some areas, as the Cordillera de Apolobamba and the Cordillera Real, both in the Department of La Paz, seem to have an especially high diversity of these frogs, often with at least one microendemic species occurring in each major valley with suitable habitat.

During the early austral summer of 2012 we crossed the Cordillera Real from the Altiplano to the Amazonian slopes, in search of *Psychrophrynella* frogs, and we found a beautiful new species in a valley not previously surveyed. Herein we present the description of this species, describe and comment on particularities of its call, report aspects of its reproductive biology, and assess conservation risk with respect to infection by the pathogenic chytrid fungus, *Batrachochytrium dendrobatidis* Longcore, Pessier and Nichols.

Material and methods

Given the highly restricted distribution and microendemism of all species of *Psychrophrynella*, for practical

Burrowes (2011) for the Bolivian species *P. adenopleura* (Aguayo and Harvey). Because population studies on species of this genus are not available we cannot infer at this point the effect of *Bd* in *Psychrophrynella* species that are presently persisting with this pathogen. While their condition of terrestrial direct-developers may work to their advantage in face of a mostly aquatic pathogen (Longcore *et al.* 1999), these frogs might be confronting a higher risk of extinction if they are also subject to other environmental stressors presently affecting the Andes, like climate warming and drought (Seimon *et al.* 2007). These factors can work in synergy with *Bd* to increase susceptibility of frogs to chytridiomycosis as reported for other members of Brachycephaloidea (Longo & Burrowes 2010; Longo *et al.* 2013; De la Riva & Burrowes 2011).

Beta-diversity of *Psychrophrynella* in Bolivia is astonishing. With 18 species described hitherto, all of them endemic, this genus represents a 27.3% of the total endemic Bolivian anuran fauna—by far the greatest contribution of any amphibian single group—and many more species await description (De la Riva 2007; De la Riva & Reichle 2014; De la Riva, unpubl.). Indeed, no other vertebrate group reaches a similar degree of endemism; this alone stands as an important reason to pay especial attention to these little, otherwise scarcely visible frogs, and justify the need to include them in conservation planning and environmental official agendas. A recent project led by Bolivian Amphibian Initiative (BAI) is currently assessing the conservation status of *P. illimani* and trying to create public awareness among locals about the necessity to preserve this and other frog species (De la Riva & Reichle 2014; see BAI's website, bolivianamphibianinitiative.org and the website of the *P. illimani* project, www.jampatu.org).

Acknowledgments

This research was possible thanks to the funding provided by project CLG2011-30393 of the Spanish Ministry of Science and Innovation (PI, Ignacio De la Riva). We are grateful to James Aparicio for his help at the Colección Boliviana de Fauna and to the DGB (Dirección General de la Biodiversidad) for providing exportation permits. We are especially indebted to Diego Llusia for kindly helping with the analyses and figures of the advertisement calls, to Jandrey López for assistance with qPCR detection, and to Noemí Goicoechea for help with Figure 3.

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