



## The aquatic and littoral forms of the Patagonian frog *Atelognathus patagonicus* (Batrachylinae): new molecular evidence

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### Abstract

*Atelognathus patagonicus* is one of the eight species included in the Patagonian genus *Atelognathus*, an endemic frog occurring in the system of endorheic basaltic lagoons of the Laguna Blanca National Park (PNLB), Neuquén, Argentina. Based on morphological data, Cei & Roig (1968) described two forms of *A. patagonicus*, which they called “aquatic” and “littoral”. These morphotypes were first suggested to belong to different species, but later, Cei (1972) proposed that both forms represent a balanced polymorphism within *A. patagonicus*. More recently, an ecomorphological study showed that aquatic and littoral are reversible forms of the same individual (phenotypic plasticity). In this paper we compare the morphotypes of *A. patagonicus* using nucleotide sequences of the mtDNA (cytochrome b and control region) in order to test the existence of genetic differentiation between the aquatic and littoral forms. In addition, we present data of genetic variability of *A. patagonicus* from the Laguna Blanca system. We did not detect genetic differentiation between littoral and aquatic morphotypes for both genes studied. This observation is consistent with the hypothesis of phenotypic plasticity. In contrast with the expected results for low vagility organisms, the diversity index observed in *A. patagonicus* revealed a low genetic variability.

**Key words:** *Atelognathus patagonicus*, phenotypic plasticity, mtDNA, morphotypes

### Introduction

*Atelognathus patagonicus* (Gallardo 1962) represents one of the eight species included in the Patagonian genus *Atelognathus* (Basso 1998; Díaz-Páez *et al.* 2011, Basso *et al.* 2011). The species is an endemic frog occurring in the system of endorheic basaltic lagoons of the Laguna Blanca National Park (PNLB), Neuquén, Argentina, where the arid climate determines vegetation of low, thorny, shrubby steppe (Cei & Roig 1968; Cuello *et al.* 2009). *Atelognathus patagonicus* was first described by Gallardo (1962) for Laguna Blanca, the largest lagoon in the system. At present, the species is extinct from its type locality due to the introduction of *Percichthys colhuapiensis* and other fish species (*Oncorhynchus mykiss* and *Salmo trutta*), but persists restricted to several smaller, isolated lagoons lacking fish surrounding Laguna Blanca. Due to its restricted distribution and threats, the species is categorized “in danger of extinction” by the Argentinean Herpetological Society (Lavilla *et al.* 2000) and “Endangered” according to the IUCN Red List of Threatened Species (Úbeda *et al.* 2008).

Based on morphological data, Cei & Roig (1968) described two forms of *A. patagonicus*, which they called “aquatic” and “littoral”. The aquatic form is found associated with underwater rocks and is characterized by well-developed interdigital membranes, highly vascularized skin forming undulating folds on the lateral and ventral regions of the trunk and on the thighs (bagginess), and orange-yellow ventral color. The littoral form is found beneath rocks outside the water (up to 80 m from the lagoon, Cuello *et al.* 2008) in an extremely arid environment. The littoral form shows emarginated interdigital membranes, absence of bagginess, and a grayish-white ventral coloration.