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Osteological description of *Pseudopaludicola canga* with implications for the taxonomic position of this taxon

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Abstract

Pseudopaludicola canga was described by Giaretta & Kokubum (2003) based on 74 individuals previously assigned to *P. mystacalis* by Lobo (1995). In the diagnosis of *P. canga*, the original authors assigned the presence of terminal T-shaped phalanges as a character state for this taxon. However, the osteology of *P. canga* is not described and the presence of toe tips not expanded laterally is a characteristic share with all members of *Pseudopaludicola* unassigned to any group. In this work is describe for first time the osteology of *P. canga*, re-examining the external morphology providing a new diagnosis and establishing the taxonomic position of *P. canga* in the framework of phylogenetic hypothesis proposed by Lobo (1995). Additionally, is compared the toe tip digit IV, between *P. falcipes* and all the species included in the *P. pusilla* group and updated the type locality of *P. canga*. The osteology reveals that *P. canga* has the toe tips not T-shaped as mentioned by the original authors and this characteristic has important consequences for the diagnosis of the species. Additionally, the erroneous inclusion of *P. canga* in the *P. pusilla* group is confirmed by the phylogenetic analysis.

Key words: *Pseudopaludicola pusilla* group, osteology, external morphology, taxonomy

Introduction

Pseudopaludicola is a genus of small-bodied frogs diagnosed by the presence of at least one tubercle on each forearm (Miranda-Ribeiro 1926; Lynch 1989; Lobo 1995). Members of this genus are widely distributed over northern and central South America, from northern Colombia to the south of Buenos Aires province in Argentina. This natural group is composed of 14 species: *P. boliviana*, *P. canga*, *P. ceratophyes*, *P. falcipes*, *P. giarettai*, *P. llanera*, *P. mineira*, *P. murundu*, *P. mystacalis*, *P. pusilla*, *P. riopiedadensis*, *P. saltica*, *P. serrana*, and *P. ternetzi* (Frost 2011; Carvalho 2012).

Lynch (1989) made the first attempt to assess the taxonomic structure of the group. In this work *Pseudopaludicola llanera* was described, *P. pusilla* and *P. boliviana* were considered as a valid species, correcting the previous synonymy proposed in Lynch (1971). Additionally, Lynch (1989) performed a cluster analysis of overall similarity, recognizing the *P. pusilla* group composed by *P. boliviana*, *P. ceratophyes*, *P. llanera*, and *P. pusilla*, grouped by the presence of toes tips T-shaped.

Lobo (1995), based on external morphology and osteological characters, proposed the first phylogenetic hypothesis for *Pseudopaludicola*, using the cladistic methodology. This work supported the genus as a natural group with three synapomorphies: presence of antebrachial tubercles; antero- and posterolateral processes of the hyoids vestigials or absents; and epicoracoids cartilages slightly overlapping each other or not overlapped. Additionally, the *P. pusilla* group proposed in the phenetic revision of Lynch (1989) was recovered as monophyletic in Lobo (1995) and supported by the presence of T-shaped phalanges, while the rest of the species of *Pseudopaludicola* remained unassigned to any group. In this sense, the shape of toe tips is an important character that allowed the diagnosis of the *P. pusilla* group (Lynch 1989; Lobo 1995). The bone expansion at the end of the