



Larval chondrocranium morphology of five species of *Proceratophrys* Miranda-Ribeiro (Amphibia; Anura; Odontophrynidae)

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Abstract

The chondrocranium and hyobranchial morphology are described for the tadpoles of five species of *Proceratophrys* Miranda-Ribeiro. The chondrocranium of *P. appendiculata*, *P. boiei*, *P. laticeps* and *P. tupinamba* are very similar and can be distinguished from that of *P. cristiceps* by: 1) less developed processus muscularis; 2) thinner palatoquadrate; 3) broadest ethmoidal region; 4) longer cornua trabeculae; and 5) morphology of the suprarostrals cartilages. A morphological variation among *Proceratophrys boiei* is described. It reveals the existence of at least three distinct evolutionary lineages under this name. A brief comparison with other cycloramphid species is also provided.

Key words: *Proceratophrys appendiculata*, *Proceratophrys boiei*, *Proceratophrys cristiceps*, *Proceratophrys laticeps*, *Proceratophrys tupinamba*

Resumo

A morfologia do condrocânio e do aparato hiobranquial é descrita para os girinos de cinco espécies de *Proceratophrys*. O condrocânio de *P. appendiculata*, *P. boiei*, *P. laticeps* e *P. tupinamba* é muito similar e pode ser distinguida da de *P. cristiceps* por: 1) processus muscularis menos desenvolvido; 2) palatoquadrado mais fino; 3) região etimoidal mais larga; 4) cornua trabeculae mais longas; e 5) morfologia da cartilagem suprarostrals. Variação morfológica entre *Proceratophrys boiei* é descrita. Ela revela a existência de pelo menos três linhagens evolutivas distintas sob esse nome. É realizada uma breve comparação como outras espécies de cycloramphídeos.

Introduction

The widely distributed genus *Proceratophrys* Miranda-Ribeiro currently comprises 31 species occurring in Brazil, Argentina, and Paraguay (Ávila *et al.* 2012; Cruz *et al.* 2012; Frost 2013; Dias *et al.* 2013). Their intrageneric relationships have never been explored deeply and most species are ordered within phenetic groups or complexes according to morphological similarity (Izecksohn *et al.* 1998; Giaretta *et al.* 2000; Kwet & Faivovich 2001; Prado & Pombal 2008).

Among the species that possess a long and single palpebral appendage are the *Proceratophrys appendiculata* and *P. boiei* species complexes (Izecksohn *et al.* 1998; Prado & Pombal 2008; Cruz & Napoli 2010). The *P. appendiculata* species complex is found only in the Atlantic Forest, from Bahia state to Santa Catarina state (Izecksohn *et al.* 1998; Cruz & Napoli 2010) and comprises ten species characterized by the presence of a triangular rostral appendage—*P. appendiculata* (Günther), *P. belzebul* Dias, Amaro, Carvalho-e-Silva and Rodrigues, *P. izecksohni* Dias, Amaro, Carvalho-e-Silva and Rodrigues, *P. laticeps* Izecksohn and Peixoto, *P. melanopogon* (Miranda-Ribeiro), *P. moehringi* Weygoldt and Peixoto, *P. phyllostomus* Izecksohn, Cruz and