



Cranial anatomy of tadpoles of five species of *Scinax* (Hylidae, Hylinae)

LEANDRO ALCALDE^{1,4}, FLORENCIA VERA CANDIOTI², FRANCISCO KOLENC³,
CLAUDIO BORTEIRO³ & DIEGO BALDO²

¹CONICET, Área Sistemática, Sección Herpetología, Instituto de Limnología "Dr. Raúl A. Ringuelet", CC 712 (1900), La Plata, Buenos Aires, Argentina. E-mail: alcalde@ilpla.edu.ar

²CONICET, Instituto de Herpetología, Fundación Miguel Lillo, Miguel Lillo 251 (4000), Tucumán, Argentina. E-mail: florivic@gmail.com; diegobaldo@gmail.com

³Sección Herpetología, Museo Nacional de Historia Natural, 25 de Mayo 582, Montevideo, Uruguay. E-mail: fkolenc@gmail.com; borteiro@gmail.com

⁴Corresponding author

Abstract

We studied the oral apparatus, buccal cavity and musculoskeletal features in tadpoles of five species of the genus *Scinax* (*S. acuminatus*, *S. uruguayus*, *S. aff. pinima*, *S. aromothyella*, and *S. berthae*). Observed variation is mainly related to intrageneric grouping. *Scinax acuminatus* (*S. ruber* clade, sister taxon of *S. rostratus* group) has a distinctive combination of a mental gap in the margin of oral papillae, straight labial teeth with few or absent cusps, processus muscularis acute and posteriorly directed, and m. subarcualis rectus I with two slips. *Scinax uruguayus* and *S. aff. pinima* (*S. uruguayus* group) have keratinized sheets ventrolateral to the lower jaw sheath, well-developed infralabial and lateral ridge papillae, robust jaw cartilages, cornua trabeculae with short and widely divergent free portions, processus articularis short and wide, processus muscularis thin and directed anteriorly. *Scinax aromothyella* and *S. berthae* (*S. catharinae* group) have poorly developed, non-colored spurs behind the lower jaw sheath, long and thin processus articularis, wide and rounded processus muscularis, and tripartite cartilago suprarostralis. Anatomical features described are congruent with current phylogenetic arrangements based on molecular, chromosomal, and morphological data, and provide a source of information that can be useful to solve interspecific relationships within *Scinax*.

Key words: anuran larvae, buccal cavity, chondrocranium, cranial muscles, hyobranchial apparatus

Introduction

Tadpole morphology is a valuable source of information to infer anuran evolution. External morphological characters have been traditionally considered informative for the higher classification of anurans (e.g., Orton 1953). More recently, the search for additional larval characters, mainly from oral cavity and musculoskeletal morphology, resulted in new hypotheses about anuran relationships at different taxonomic levels (Sokol 1975; Wassersug 1980; Wassersug & Heyer, 1988). Recent cladistic analyses have been the source of remarkable changes in anuran systematics, but most of them have been mainly based on molecular data (e.g., Frost *et al.* 2006; Grant *et al.* 2006; Roelants *et al.* 2007), and the lack of suitable morphological data sets is a recognized weak point of some of these studies (Faivovich *et al.* 2005; Frost *et al.* 2006).

Larval characters have rarely been used for extensive phylogenetic analysis, except for a few works (Haas 2003 and references therein). The phylogenetic analysis by Haas (2003) based on larval characters suggested the non monophyly of the widespread family Hylidae, as was also the case of some of its genera as then recognized. In a recent taxonomic review of this family, many larval characters were proposed as synapomorphic for different level taxonomic categories, highlighting the relevance of the knowledge of larval morphology (Faivovich *et al.* 2005).

Within Hylinae, the Neotropical genus *Scinax* is one of the largest, comprising almost 100 species (Frost 2009). Two major clades are recognized within the genus, the *S. catharinae* and the *S. ruber* clades (Faivovich