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A new caruncle-bearing *Limnonectes* (Anura: Dicroglossidae) from northeastern Thailand

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Abstract

A new species of the dicroglossid frog genus *Limnonectes* is described from Ubon Ratchathani Province, northeastern Thailand. *Limnonectes lauhachindai* **sp. nov.** differs from its congeners by having males with a low-profiled, U-shaped caruncle with free posterior margin that completely occupies, but does not extend beyond, the interobital region. The new species is most closely related to *L. gyldenstolpei* and *L. dabanus*. Its description brings the total number of caruncle-bearing species of *Limnonectes* to five.

Key words: caruncle, *Limnonectes gyldenstolpei*, *Limnonectes dabanus*, Ubon Ratchathani

Introduction

Adult males of four species of Southeast Asian dicroglossid frogs in the genus *Limnonectes* exhibit extreme secondary sexual characteristics, including enlarged odontoid processes on the lower jaw, hypertrophied heads, and, most unusually, ornamentation consisting of a swollen or cap-like structure (caruncle; Lambertz *et al.* 2014) on top of their heads (Boulenger 1916; Boulenger 1917; Boulenger 1920; Lambertz *et al.* 2014; Rowley *et al.* 2014; Smith 1922; Stuart *et al.* 2006b). These include *L. dabanus* (Smith 1922), *L. gyldenstolpei* (Andersson 1916), *L. macrognathus* (Boulenger 1917), and *L. plicatellus* (Stoliczka 1873), four species that represent a monophyletic group (Lambertz *et al.* 2014). The caruncles in these four species are homologous structures consisting of a dense pad of connective tissue on top of the frontoparietal bones (Lambertz *et al.* 2014). Caruncles are species-specific in their shape, ranging from a low-profile, domed structure without a free posterior edge (in *L. macrognathus*), to a large, flap-like, U-shaped structure with a free posterior edge (in *L. gyldenstolpei*), to a high-profile, horn- or knob-like process (in *L. plicatellus*) or dome-like structure (in *L. dabanus*; Lambertz *et al.* 2014). The function of the caruncles remains unknown, but they may serve a function in male-male combat (Lambertz *et al.* 2014; Rowley *et al.* 2014).

Our fieldwork in 2004 (reviewed in Stuart *et al.* 2006a), 2011 and 2012 at two localities in Ubon Ratchathani, northeastern Thailand, revealed an additional species of *Limnonectes* having males with distinct, cap-like caruncles, but that differed morphologically and genetically from all other known species. Herein, we describe this species as new.

Material and methods

Sampling. Specimens were collected by hand and fixed in 10% buffered formalin after preserving liver in 20% dimethyl sulfoxide salt-saturated storage buffer or 95% ethanol. Specimens were later transferred to 70% ethanol.

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