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A new species of *Kaloula* (Amphibia: Anura: Microhylidae) from southern Guangxi, China

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Abstract

A new species of narrow-mouthed frog of *Kaloula* is described in the Nonggang National Nature Reserve, Sino-Vietnamese border region of southern China. *Kaloula nonggangensis* sp. nov. is distinguished from its congeners by a combination of the following characters: medium size (SVL 41.4–52.7 mm in 18 adult males, 52.2 mm in 1 female); smooth or slightly rough olive dorsum with irregular dark-green marks and brown spots; tips of the fingers widely dilated and truncated; males with nearly fully webbed toes; males with two side protuberant osseous tubercles on the upper surface of the tips of fingers and chest beige with small lemon-colored spots. *K. nonggangensis* sp. nov. is found in habitats ranging from cultivated fields adjacent to the forest to primary evergreen forest in karst habitats. Based upon a 16S ribosomal RNA mitochondrial gene fragment, *K. nonggangensis* sp. nov. is embedded within the *K. verrucosa* group (including *K. borealis*, *K. rugifera* and *K. verrucosa*), and displays a low genetic distance to these species (< 3%). Considering the distinct morphology and karyotype we nevertheless suggest a status as separate species for these allopatrically distributed lineages.

Key words: Southern China, *Kaloula nonggangensis* sp. nov., Sino-Vietnamese border area

Introduction

The genus *Kaloula* Gray, 1831 (Anura: Microhylidae) contains 15 species, distributed throughout Korea and northern China to Lesser Sundas and Philippines, Bangladesh, India, and Sri Lanka (Diesmos *et al.* 2002; Das *et al.* 2004; Fei *et al.* 2009; Frost 2013). Presently, only four species of *Kaloula* (*K. borealis* Barbour, 1908, *K. pulchra* Gray, 1831, *K. rugifera* Stejneger, 1924 and *K. verrucosa* Boulenger, 1904) have been reported in China (Fei *et al.* 2009). Among them, *K. rugifera* and *K. verrucosa* are endemic species, the former restricted to Sichuan and Gansu Provinces, the latter restricted to Sichuan, Guizhou and Yunnan Provinces. *K. borealis* and *K. pulchra* are common species, the former found in central and northeast China, the latter found in southern China (Figure 1) (Fei *et al.* 2009; Frost 2013).

From 2011 to 2012, herpetological surveys near the Sino-Vietnamese border, Guangxi Province, China, were undertaken. During these surveys, we discovered a medium-sized species of narrow-mouthed frog that most closely resembles its allopatrically distributed close relatives *K. borealis*, *K. rugifera* and *K. verrucosa*, but based on the following morphological characters: lack of bumpy skin on dorsal surface, tips of the fingers widely dilated and truncated; well-developed webbed in males, males with two side protuberant osseous tubercles on the upper surface of the tips of fingers, chest beige with small lemon-colored spots and absent lateral bands, those specimens differ from all other *Kaloula* from China and adjoining countries. Molecular analyses revealed that those specimens and *K. borealis*, *K. rugifera* and *K. verrucosa* formed a monophyletic group, with low genetic differentiation. Considering distinct morphological characters, we describe this lineage as a new species.