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Genetic and morphological evidence on the species validity of *Gekko melli* Vogt, 1922 with notes on its diagnosis and range extension (Squamata: Gekkonidae)

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Abstract

Mell's gecko *Gekko melli* Vogt, 1922, a poorly known gecko species in China, had been previously treated as synonym of *Gekko subpalmatus* for a rather long time. It was recently resurrected as a valid species on the basis of morphological comparisons of type specimens with the latter species. In this study, we confirmed the specific validity of *G. melli* based on a set of specimens we collected from China, as well as on the basis of molecular genetic analysis. We also provide a more complete morphological description and diagnosis of *G. melli*.

Key words: *Gekko melli*, *Gekko subpalmatus*, species validity, 16S rRNA, taxonomy, China

Introduction

Mell's gecko *Gekko melli*, was originally described by Vogt (1922) based on series of specimens collected from northeastern Guangdong Province, China. It had long been treated as a synonym of *G. subpalmatus* Günther (Pope 1935; Kluge 1991; Zhao & Adler 1993; Zhao *et al.* 1999). Rösler *et al.* (2005) resurrected *G. melli* as a full species from *G. subpalmatus* by comparing morphologies of the type specimens of both species. However, due to the paucity of field observations and specimens of *G. melli*, and a lack of molecular data for *G. melli* and *G. subpalmatus*, the validity of the specific status of *G. melli* still needs clarification. Further, the geographical distribution of *G. melli* in China remains ambiguous.

We collected eight specimens of genus *Gekko* from southern Jiangxi Province and eastern and southern Guangdong Province, China in 2010–2011. We identified these specimens as *G. melli* based on the combination of the following characters: internasal single; interorbitals 34–40; dorsal tubercles absent; fingers and toes webbed; one postcloacal tubercle on each side of the base of tail; dorsal scales in nine rows in the middle of the third caudal whorl; a distinct W-shaped dark-brown marking on posterior of head and several wide, irregular, dark brown and sepia-edged bands on dorsum of body (Rösler *et al.* 2005; Rösler & Tiedemann 2007). This new set of specimens includes three males and five females, and represents the first confirmed record of the species other than the types, as well as the first record of female specimens. Moreover, these specimens are from three new localities. Herein, we describe our newly collected specimens of *G. melli*, with notes on variation and diagnostic characters of the species. Further, we assess the specific validity of this poorly-known and controversial gecko based on sequence data from the 16S rRNA mitochondrial gene.

Material and methods

Specimens. Sun Yat-sen University (SYS) r000095, adult male, Liangtian village, Jiexi County, Guangdong Province, China (23°36'00.0"N, 115°49'09.9"E, 640 m a.s.l.), collected by Jian-Huan Yang and Qing Du, 17 April