



Molecular evidence on the systematic position of the lance-headed pitviper *Protobothrops maolanensis* Yang *et al.*, 2011

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Abstract

In order to assess the phylogenetic position of the recently described *Protobothrops maolanensis* Yang *et al.*, 2011, we reconstructed relationships within the genus *Protobothrops* based on four mtDNA gene fragments (12S RNA, 16S RNA, ND4 and cyt b). Phylogeny reconstruction consistently recovered a sister relationship between *P. maolanensis* and *P. elegans* though with unconvincing support. However, a clade composed of *P. maolanensis*, *P. mucrosquamatus* and *P. elegans* was recovered with strong support. The genetic distance between *P. maolanensis* and *P. elegans* and between *P. maolanensis* and *P. mucrosquamatus* is relatively high compared to other sister-species comparisons within sampled *Protobothrops*. Given the molecular results and morphological differences, we conclude that *P. maolanensis* is a valid species closely related to *P. elegans* and *P. mucrosquamatus*.

Key words: Asia, China, systematics, venomous snakes, Viperidae

Introduction

The genus *Protobothrops* Hoge & Romano-Hoge, 1983 was erected based on skull characters and the ultrastructure of scales. Originally, only the species *P. flavoviridis* (Hallowell, 1861), *P. jerdonii* (Günther, 1875) and *P. mucrosquamatus* (Cantor, 1839) were included in this genus (Hoge & Romano-Hoge 1983). Subsequent phylogenetic analyses have reclassified *P. elegans* (Gray, 1849), *P. tokarensis* (Nagai, 1928), *P. kaulbacki* (Smith, 1940), *P. xiangchengensis* (Zhao *et al.*, 1979) and *P. cornutus* (Smith, 1930) to this genus (Krause *et al.* 1996; David & Ineich 1999; Herrmann *et al.* 2004; Malhotra & Thorpe 2004; Guo *et al.* 2006). Based on more extensive sampling of *Protobothrops* and related viperids, Guo *et al.* (2007) proposed to synonymize both *Zhaermia* and *Triceratolepidophis* with *Protobothrops*. Additionally, two new species, *P. trungkhanhensis* Orlov *et al.*, 2009 and *P. maolanensis* Yang *et al.*, 2011 have been described recently, increasing the total number of species in the genus to twelve (Orlov *et al.* 2009; Yang *et al.* 2011).

Protobothrops maolanensis Yang *et al.*, 2011 was recently described from Guizhou, southwestern China. Based on Yang *et al.*'s (2011) description, it differs from its congeners by a combination of scalation, body proportions and color pattern. The phylogenetic position of *P. maolanensis* within *Protobothrops* has not been clarified, although Yang *et al.* (2011) proposed that *P. maolanensis* was superficially most similar to *P. trungkhanhensis* in appearance. Here, based on four mitochondrial gene fragments, we assess the phylogenetic affinities of this recently described viperid.