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Article

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Two new species of pitviper of the genus *Cryptelytrops* Cope 1860 (Squamata: Viperidae: Crotalinae) from Southeast Asia

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Abstract

We describe two new species of green pitviper from Southeast Asia that are morphologically similar to *Cryptelytrops macrops,* but can be distinguished from that species by genetic means, multivariate analysis of morphology and some aspects of coloration. *Cryptelytrops cardamomensis* **sp. nov**., is described from southeastern Thailand and the Cardamom Mountains of southwestern Cambodia. *Cryptelytrops rubeus* **sp. nov**. has been recorded from southern Vietnam and eastern Cambodia. These species have previously been confused with *C. macrops,* hence we also present here a redescription of this species, whose range is now restricted to Thailand, southern and central Laos, and northeastern Cambodia. All three species are present in Cambodia, but have disjunct ranges corresponding to three separate highland regions in southwestern (Cardamom Mountains), northeastern (western edge of the Kontum Plateau) and eastern (low elevation hills on the western edge of the Langbian Plateau) Cambodia for *C. cardamomensis*, *C. macrops* and *C. rubeus* respectively. However, there is still considerable morphological variation between geographically separated populations of *C. macrops s.s.,* and greater sampling in southern and northern Thailand in particular may be required before the species diversity of this group is fully clarified.

Key words: *Cryptelytrops cardamomensis* **sp. nov**., *Cryptelytrops macrops*, *Cryptelytrops rubeus* **sp. nov.**, green pitviper, multivariate morphometric analysis, *Trimeresurus*

Introduction

Recently, molecular work has helped to resolve some particularly vexing taxonomic issues among the green pitvipers, formerly all included in the genus *Trimeresurus,* but since 2004 placed in seven distinct genera (Malhotra & Thorpe 2004a). A growing interest in these beautiful animals among herpetoculturists and the increased opportunity to travel in Southeast Asia has led to a better understanding of species distribution and variation (Gumprecht *et al.* 2004). Using both traditional morphology-based systematics and more modern approaches combining molecular and multivariate analyses, a number of cryptic species have been recently identified among Asian pitvipers (David *et al*. 2006; Malhotra & Thorpe 2004b; Sanders *et al.* 2006). Specimens obtained during recent herpetological surveys in Laos, Cambodia and Vietnam (Stuart 1999; Stuart *et al*. 2006a Stuart & Emmett 2006; Stuart *et al.* 2010), have helped to shed light on the taxonomy of another of the green pitvipers, *Cryptelytrops macrops.* Though superficially resembling *C. albolabris*, this species has in fact been shown to be closely related to two banded and narrowly distributed species, *C. venustus* and *C. kanburiensis* (Malhotra & Thorpe 2004a) and in more recent analyses including nuclear as well as mitochondrial sequence data (Malhotra *et al.* 2010), some specimens of *C. macrops* appeared to be paraphyletic with respect to *C. venustus.*

More extensive geographical sampling has made it possible to distinguish at least three genetically distinct units within the specimens currently referred to *C. macrops,* using both mitochondrial (12S and 16S rRNA, NADH4) and nuclear loci (298 AFLP markers) (Mrinalini *et al*., unpublished data). These genetically distinct units are also geographically separated (Fig. 1). Here, we present an analysis of morphological variation among specimens currently referred to *C. macrops,* identify diagnostic differences between genetically distinct OTUs, formally

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