Zootaxa 3755 (5): 447–456
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3755.5.4
http://zoobank.org/urn:lsid:zoobank.org:pub:6DE7DAEA-16AA-48F8-BEE2-D485D0578151

A new species of insular Rock Gecko (Genus *Cnemaspis* Strauch, 1887) from the Bidong Archipelago, Terengganu, Peninsular Malaysia

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Abstract

A new insular species *Cnemaspis bidongensis* **sp. nov.** (Squamata: Gekkonidae), is described from Pulau Bidong, Terengganu, Peninsular Malaysia and bears a unique suite of morphological and color pattern characters that differentiate it from all other congeners. *Cnemaspis bidongensis* **sp. nov.** is the sister species to *C. kendallii* (Gray) and represents the fifth insular endemic species of *Cnemaspis* on archipelagos along the east coast of Peninsular Malaysia. This species survived massive deforestation of the small island of Bidong (260 ha) from the mid 1970s to the early 1990s when the island served as a Vietnamese refugee camp and harbored as many as 40,000 people at one time. We hypothesize that this species' generalized lifestyle contributed to its survival, allowing it to seek refuge in rocky microhabitats.

Key words: new species, *Cnemaspis*, endemic, Bidong Island, conservation, biodiversity, Terengganu, Peninsular Malaysia

Introduction

The archipelagos of the South China Sea are proving to be some of the most herpetologically diverse islands in Southeast Asia (Grismer *et al.* 2011; Leong *et al.* 2003). Even though those along the southern coast of Vietnam and the east coast of Peninsular Malaysia have been well-studied (Grismer 2011a; Grismer *et al.* 2006, 2011), the increase in their diversity and endemism shows no signs of abating (i.e., Chan & Norhayati 2010; Chan *et al.* 2011; Das & Grismer 2003; Das & Jim 2000; Diaz *et al.* 2004; J. Grismer *et al.* 2003; Grismer 2005, 2006; Grismer & Chan 2008; Grismer & Das 2006; Grismer & Ngo 2007; Grismer *et al.* 2003, 2004a,b, 2008, 2009, 2010a; Ngo 2008; Ngo & Grismer 2012; Ngo *et al.* 2008, 2010; Youmans & Grismer 2006).

One of the island systems along Peninsular Malaysia just recently surveyed (Vazquez *et al.* in prep.) is the Bidong Archipelago, lying 35 km northeast of Kuala Terengganu, Terengganu (Fig. 1) that is composed of six well-vegetated, low-lying islands. Given that the Perhentian Archipelago to the north and the Tenggol Archipelago to the south harbor endemic species of lizards (Chan & Norhayati 2010; Grismer & Chan 2008; Grismer *et al.* 2009), it is not surprising that a recent survey of the Bidong Archipelago (Vazquez *et al.* in prep.) resulted in the discovery of a new, presumably endemic gekkonid. The six specimens collected have broad, flattened heads; large, somewhat forward and upwardly directed eyes bearing round pupils; a flattened body; and long, widely splayed limbs bearing long, inflected digits which place them in the genus *Cnemaspis* (Grismer *et al.* 2010b). However, they bear a suite of unique character states and a large, uncorrected percent sequence divergence from closely related species that indicates they belong to a new species. As such the population is described herein.

Accepted by A. Bauer: 16 Dec. 2013; published: 24 Jan. 2014

Comparisons. *Cnemaspis bidongensis* **sp. nov.** is a member of a monophyletic lineage referred to as the *kendallii* group (Grismer *et al.* in prep.) which contains *C. kendallii*; *C. baueri* Das & Grismer and *C. pemanggilensis* Grismer & Das and is diagnosed by having a maximum SVL 50.5–81.0 mm; 7–13 supralabials; 7–12 infralabials; keeled ventral scales; no precloacal pores; 17–37 paravertebral tubercles; caudal tubercles not restricted to a single paravertebral row; lateral row of caudal tubercles present; 1–4 postcloacal tubercles on each side of tail base; no enlarged femoral or subtibial scales; submetatarsal scales of first toe not enlarged; subtibials keeled; and 26–38 subdigital fourth toe lamellae. *Cnemaspis bidongensis* differs from all members of the *kendallii* group in having an enlarged, elongate mental scale extending posteriorly to the level of the fourth infralabials bordered posterolaterally by an enlarged postmental and a sexually dimorphic dorsal body pattern. Within this group *C. bidongensis* is most closely related to *C. kendallii* from which it differs by lacking as opposed to having tubercles on the ventral portions of the flanks; having as opposed to lacking an enlarged, median, subcaudal scale row; having as opposed to lacking a sexually dimorphic dorsal body pattern. From *C. baueri, C. bidongensis* **sp. nov.** differs by having a smaller maximum SVL (58.1 mm versus 67.4 mm); nine or 10 versus 11–13 supralabials; and a dorsal body pattern that contains elements of dark and light blotching (Fig. 1). *Cnemaspis bidongensis* **sp. nov.** can be differentiated from *C. pemanggilensis* in having 21–26 versus 30–37 paravertebral tubercles. These differences are represented in Table 1.

Discussion

Like mountain tops, the islands of Peninsular Malaysia have always been areas of relatively high endemism (Grismer 2011a; Grismer & Pan 2008; Grismer *et al.* 2010c, 2011) despite the fact they have received much less attention than continental regions. Nonetheless, field work on islands off the coasts of Peninsular Malaysia continues to uncover a surprising amount of herpetological diversity bearing an ever growing component of endemism. Thus, it is not surprising that a survey of the five islands of the previously herpetologically unexplored Bidong Archipelago resulted in the discovery of a new, endemic species of *Cnemaspis.* Endemic species of this genus are well-represented on Peninsular Malaysian islands with *C. roticanai* Grismer & Chan from the Langkawi Archipelago in the northwest; *C. perhentianensis* Grismer & Chan from the Perhentian Archipelago in the northeast and *C. limi* Das & Grismer, *C. pemanggilensis* Grismer & Das, and *C. baueri* Das & Grismer from the Seribuat Archipelago in the southeast (Grismer 2011a; Fig. 1). We expect that additional endemic species of reptiles will be found on the large island of Redang and from some of the small satellite islands in the Tenggol Archipelago that have yet to be thoroughly explored. We expect much the same pattern on islands of the Sembilan Archipelago along the west coast.

Acknowledgements

We wish to thank Mr. Baharim B. Mustapa, Head of Bidong Research Unit for facilitating the trips and Universiti Malaysia Terengganu for permission to conduct research on Bidong Island. This research was supported in part by grants to LLG from the College of Arts and Sciences, La Sierra University, Riverside, California. We would like to thank Jack W. Sites Jr. for funding the molecular work conducted in this study.

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