

ON THE DISTRIBUTION AND IDENTIFICATION OF *CYRTODACTYLUS BREVIPALMATUS* SMITH, 1923, AND *CYRTODACTYLUS ELOK* DRING, 1979

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ABSTRACT. – It is shown here that *Cyrtodactylus brevipalmatus* is endemic to Thailand, *C. elok* is endemic to West Malaysia, and reports of the former being present in West Malaysia are erroneous. *Cyrtodactylus elok* is reported here for the first time from the Banjaran Titiwangsa (Titiwangsa Mountain Range) at Cameron Highlands, Fraser's Hill, the Lakum Forest Reserve in Pahang and from Seremban in Negeri Sembilan.

KEY WORDS. – *Cyrtodactylus brevipalmatus*, *Cyrtodactylus elok*, Banjaran Titiwangsa, West Malaysia.

INTRODUCTION

Cyrtodactylus brevipalmatus was described by Smith (1923) on the basis of two specimens from Khao Luang, Nakhon Si Thammarat, Thailand (Fig. 1). This was followed by Smith (1930) and Smith (1935) who reported an additional specimen from Ban Pa Che, Raheng (now Tak in Tak Province) nearly 800 km to the north in northwestern Thailand. Taylor (1963) followed Smith's (1923) taxonomy but was unaware of Smith's (1935) additional specimen from Tak. Welch et al. (1990) followed Smith's (1930) error in listing *C. brevipalmatus* from Kampuchea [Cambodia], apparently unaware that Smith implicitly rectified this error by omitting the record in Smith (1935; see Ulber, 1993). The distribution gap between Tak and Nakhon Si Thammarat was bridged by Ulber's (1993) examination of a specimen from Kaeng Krachan National Park, Phetchabun (Petchaburi) Province, Thailand and the Nabhitabhata et al. (2000) record from Huai Kha Khaeng, Uthai Thani Province (Fig. 1). Manthey & Grossmann (1997) reported *C. brevipalmatus* from Phuket Province, however Grossmann & Tillack (2002) noted that this was based on a misidentification.

Grandison (1972) was the first to report *Cyrtodactylus brevipalmatus* from West Malaysia based on a specimen collected from Gunung Benum, Pahang which she tentatively referred to as *Cyrtodactylus ? brevipalmatus*. She noted that although it matched *C. brevipalmatus* in general morphology and colour pattern, it differed in having fewer tubercles across the body, lacking femoral pores, having a square rather than cylindrical tail in cross-section, and having much larger tubercles in the dorsolateral caudal rows. Dring (1979) quantified these differences and presented others when

reporting on an additional *Cyrtodactylus* from Sungai Kelebang at Mukim Ulu Setiu, Ulu Besut along the base of Gunung Lawit, Terengganu, 180 km to the northeast of Gunung Benum (Fig. 1). Dring (1979) used these specimens as the type material for his description of *C. elok* and designated Grandison's (1972) Gunung Benum specimen as the holotype. Denzer & Manthey (1991) reported *C. brevipalmatus* from an unknown locality in "Perak [West Malaysia]" (unpublished record, W. Grossmann, Berlin) although an identification of the specimen was not confirmed. In a 2006 communiqué to Ulrich Manthey, W. Grossmann

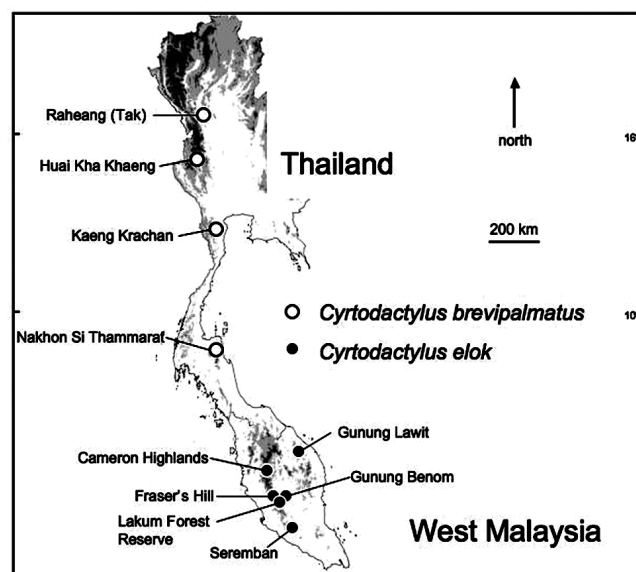


Fig. 1. Distribution of *Cyrtodactylus brevipalmatus* and *C. elok* in Thailand and West Malaysia, respectively.

Table 1. Selected diagnostic characters of *Cyrtodactylus brevipalmatus* and *C. elok* from Smith (1923, 1930, 1935), Grandison (1972), and Dring (1979), the new records of *C. elok* from Cameron Highlands (LSUHC 8238–39) and Fraser’s Hill (ZRC 2.6091) Pahang, West Malaysia, and an additional specimen of *C. brevipalmatus* (LSUHC 1899) from Nakhon Si Thammarat, Thailand. / = character not applicable.

	<i>C. elok</i>						<i>C. brevipalmatus</i>	
	data from literature	LSUHC 8238	LSUHC 8239	ZRC 2.6091	DWNP 3029	DWNP 3030	data from literature	LSUHC 1899
Sex		female	female	female	female	male		female
Number of enlarged preanal scales	8	8	8	9	9	10	7–9	8
Number of preanal pores	8	0	0	0	0	7	7–9	0
Enlarged femoral scales present (1) or absent (0)	0	0	0	0	0	0	1	1
Femoral pores present (1) or absent (0) in males	0	/	/	/	/	0	6–7	/
Tubercles across midbody	6–10	6	5	6	9	10	14–18	12
Tubercles on flanks present (1) or not (0)	0	0	0	0	0	0	1	1
Tail circular (1) or square (0) in cross-section	0	0	0	0	0	0	1	1
Tubercles of dorsolateral caudal rows large (1) or small (0)	1	1	1	1	1	1	0	0
Ventrolateral caudal fringe extensive (1) or slightly enlarged (0)	1	1	1	1	1	1	0	0
Caudal segments wide (1) or narrow (0)	0	0	0	0	0	0	0	0

indicated he did not remember from where in Perak the specimen came and according to U. Manthey (pers. comm., 2006), W. Grossmann probably acquired the animal from a Malaysian reptile dealer. The lingering possibility of *C. brevipalmatus* being in West Malaysia has influenced subsequent authors in both the popular and scientific literature to consider this species as a potential (Cox et al., 1998; EMBL online Reptile Data Base; Manthey & Grossmann, 1997) or actual (Welch et al., 1990; Das & Norsham, 2007) component of West Malaysia’s herpetofauna. Even a recently collected (25 Jul.2004) specimen from Fraser’s Hill, Pahang, West Malaysia by a team of herpetologists conducting a field survey, deposited the specimen into the Zoological Reference Collection of the Raffles Museum of Biodiversity Research (ZRC 2.6091) under the specific nomen of *C. brevipalmatus*.

Reported here are the results of an analysis of four specimens of *Cyrtodactylus elok* from new localities at Cameron Highlands (La Sierra University Herpetological Collection [LSUHC] 8238–39) and the Lakum Forest Reserve (Department of Wildlife and National Parks [DWNP 3029–30]), Pahang and the putative *C. brevipalmatus* (ZRC 2.6091) from Fraser’s Hill, Pahang (Figs. 1, 2). These specimens are compared to descriptions of *C. brevipalmatus* (Smith, 1923, 1930, 1935; Taylor, 1963; Ulber, 1993), descriptions of *C. elok* (Dring, 1979; Grandison, 1972), a specimen of *C. brevipalmatus* (LSUHC 1899) from Nakhon Si Thammarat, Thailand and to close-up photographs in the La Sierra University Digital Photographic Collection (LSUDPC) of specimens (including the type material at the Natural History Museum in London) of both *C. brevipalmatus* (BMNH 1926.12.7.1, 1931.6.12.6, 1946.8.23.11; LSUDPC 2283–91) and *C. elok* (BMNH 1967.2783, 1974.4912; LSUDPC 2292–99).

Grandison (1972), Dring (1979), and Ulber (1993) listed character states that distinguish *Cyrtodactylus brevipalmatus* from Thailand from *C. elok* noting that males of the former species have femoral pores as opposed to lacking them; have 14–18 tubercles across the mid-section of the trunk as opposed to having 6–10; have tubercles on the flanks as opposed to lacking them; the tail being circular as opposed to square in cross-section; and that the tubercles of the dorsolateral caudal rows are large (2–3 times the size) as opposed to small. Additionally, the caudal segments of *C. elok* are narrow and square, being as long as the height of the tail as opposed to being longer and more rectangular and longer than the height of the tail as in *C. brevipalmatus*. *Cyrtodactylus elok* from Cameron Highlands (LSUHC 8238–39), the Lakum Forest Reserve (DWNP 3029–30), and the putative *C. brevipalmatus* (ZRC 2.6091) from Fraser’s Hill possess all the above opposing character states which clearly identify them as *C. elok* and differentiate them from *C. brevipalmatus* (Table 1). Therefore, these five specimens are considered to represent new distribution records for *C. elok* in West Malaysia and are the first records of this species from the Banjaran (mountain range) Titiwangsa (Fig. 1). To this is added the photograph of a specimen of *C. elok* (LSUDPC 3108) from Seremban, Negeri Sembilan which clearly shows all the diagnostic characteristics of the caudal morphology.

Given the general similarity between *Cyrtodactylus brevipalmatus* and *C. elok* in having a cryptic color pattern coupled with some very unique, behavioural and morphological attributes such as a spinose tail which is usually kept tightly coiled and held close to the body, webbing on

the hands and feet, and large eyes with silver-white irises (cf. Manthey & Grossmann, 1997:Fig. 156 with Fig. 2 lower left of *C. brevipalmatus* specimens from Khao Luang, Nakhon Si Thammarat, Thailand to *C. elok* in Fig. 2 below), it is not surprising that, in the absence of a close examination, *C. elok* has been confused with *C. brevipalmatus*. Although, it would be more parsimonious to assume the record of *C. brevipalmatus* from Perak, West Malaysia is instead *C. elok* and represents a range extension to the north of 175 km at most, as opposed to a range extension of at least 450 km to the south of *C. brevipalmatus* (Fig. 1), it is argued here that in the absence of a specimen or a photograph, neither case can be scientifically supported and that the record be omitted. Until vouchered evidence is presented otherwise, *C. brevipalmatus* is considered endemic to Thailand and *C. elok* endemic to West Malaysia.

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LITERATURE CITED

- Cox, M. J., P. P. van Dijk, J. Nabhitabhata & K. Thirakhupt, 1998. *A Photographic Guide to Snakes and Other Reptiles of Peninsular Malaysia, Singapore and Thailand*. New Holland Publishers (UK) Ltd, London. 144 pp.
- Das, I. and Y. Norsham, 2007. Status of knowledge of the Malaysian herpetofauna. In: Chua, L. (ed.), *Status of Biological Diversity in Malaysia and Threat Assessment of Plant Species in Malaysia*. Forest Research Institute Malaysia, Kepong. Pp. 31–81.
- Denzer, W. & U. Manthey, 1991. A nominal checklist of the lizards inhabiting peninsular Malaysia and Singapore. *Raffles Bulletin of Zoology*, **39**: 309–322.
- Dring, J. C. M., 1979. Amphibians and reptiles from northern Trengganu, Malaysia, with descriptions of two new geckos: *Cnemaspis* and *Cyrtodactylus*. *Bulletin of the British Museum (Natural History)*, **34**: 181–241.
- Grandison, A. G. C., 1972. The Gunong Benom Expedition 1967. 5. Reptiles and amphibians of Gunong Benom with a description of a new species of *Macrocalamus*. *Bulletin of the British Museum of Natural History (Zoology)*, **23**: 45–101.
- Grossmann, W. & F. Tillack, 2002. Bemerkungen zur Herpetofauna des Khao Lak, Phang Nga, thailändische Halbinsel Teil I: Einführung; Amphibia; Reptilia: Sauria. *Sauria*, **22**: 23–38.
- Manthey, U. & W. Grossman, 1997. *Amphibien und Reptilien Südasiens*. Natur und Tier Verlag, Münster, Germany. 512 pp.
- Nabhitabhata, J., T. Chan-ard & Y. Chuaynkern, 2000. *Checklist of Amphibians and Reptiles in Thailand*. Office of Environmental Policy and Planning, Bangkok. 152 pp.
- Smith, M. A., 1923. Notes on reptiles and batrachians from Siam and Indochina. *Journal of the Natural History Society of Siam*, **6**: 47–53.
- Smith, M. A., 1930. The Reptilia and Amphibia of the Malay Peninsula. *Bulletin of the Raffles Museum*, **3**: 1149.
- Smith, M. A., 1935. *The Fauna of British India, including Ceylon and Burma. Reptilia and Amphibia. Vol. II Sauria*. Taylor and Francis, London. 440 pp.
- Taylor, E. H., 1963. The lizards of Thailand. *University of Science Kansas Bulletin*, **44**: 687–1077.
- Ulber, T., 1993. Bemerkungen über Cyrtodactyline Geckos aus Thailand nebst Beschreibungen von zwei neuen Arten (Reptilia: Gekkonidae). *Mitteilungen aus dem Zoologischen Museum, Berlin*, **69**: 187–200.
- Welch, K. R. G., P. S. Cooke & A. S. Wright. 1990. *Lizards of the Orient: A Checklist*. Robert E. Krieger Publishing Company, Malabar, Florida. 162 pp.



Fig. 2. *Cyrtodactylus elok* from Pahang, West Malaysia: Top, LSUHC 8238 from Cameron Highlands (photo by LLG); Middle, LSUHC 8239 from Cameron Highlands (photo by LLG); Bottom right, ZRC 2.0691 from Fraser's Hill (photo by Jeet Sukumaran). Bottom left, *Cyrtodactylus brevipalmatus* from Khao Luang, Nakhon Si Thammarat, Thailand (photo by U. Manthey).