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## A third new *Cyrtodactylus* (Squamata: Gekkonidae) from Ba Den Mountain, Tay Ninh Province, southern Vietnam

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### Abstract

We describe the third new species of the genus *Cyrtodactylus* from Ba Den Mountain, Tay Ninh Province, southern Vietnam based on a type series consisting of eleven specimens. *Cyrtodactylus thuongae* **sp. nov.** is distinguished from the remaining Indochinese Bent-toed Geckos by a combination of the following morphological characters: size medium, with a maximum SVL of 77.6 mm; dorsal pattern consisting of blotches between limbs and on occiput and a sometimes medially opened nuchal loop; dorsal tubercles in 16–18 irregular rows; ventrals in 29–44 longitudinal rows at midbody; lateral skin folds present, lacking tubercles; femoral pore series separated from precloacal pore series in males, 0–3 on each side; precloacal pores in males absent or only one; enlarged femoral scales and precloacal scales present, separated by a series of 15–16 smaller scales; postcloacal spurs two or three; subcaudal scales slightly enlarged. This is the 32<sup>nd</sup> described *Cyrtodactylus* species from Vietnam.

**Key words:** *Cyrtodactylus thuongae* **sp. nov.**, Tay Ninh Province, southern Vietnam, morphology, taxonomy

### Introduction

*Cyrtodactylus* is the most species-rich genus of gekkonids, with a total of 172 species to date (e.g., Kluge 2001; Schneider *et al.* 2010; Nguyen *et al.* 2013; Uetz 2013), which increases annually by new descriptions (Nguyen *et al.* 2013; Ziegler *et al.* 2013). Its radiation extends throughout tropical South Asia, Indochina, the Philippines, the Indo-Australian Archipelago, and the Solomon Islands in the East (Bauer & Henle 1994). At present, Vietnam is one of the countries with the highest diversity and endemism in the genus *Cyrtodactylus* with 31 recorded species and across a number of different adaptative types (e.g., Nguyen *et al.* 2013; Ziegler *et al.* 2013). One example is the occurrence of three cryptic species in the Phong Nha-Ke Bang National Park, namely *C. phongnhakebangensis* Ziegler, Rösler, Hermann & Vu, 2002, *C. cryptus* Heidrich, Rösler, Vu, Böhme & Ziegler, 2007 and *C. roesleri* Ziegler, Nazarov, Orlov, Nguyen, Vu, Dang, Dinh & Schmitz, 2010, which co-occur at a single site, where they have adapted to different microhabitats (Loos *et al.* 2012). Another case of sympatric *Cyrtodactylus* is reported from Ba Den Mountain in Tay Ninh Province, southern Vietnam, namely *C. nigriocularis* Nguyen, Orlov & Darevsky, 2006 and *C. badenensis* Nguyen, Orlov & Darevsky, 2006. Recent field surveys have led to the discovery of a third *Cyrtodactylus* species from Ba Den Mountain, co-occurring with the endemic *C. nigriocularis* and *C. badenensis* in the same habitat, and which is herein described as new species, based on distinct morphological characters.

**Natural history notes.** *Cyrtodactylus thuongae* inhabits the same habitat with two other co-occurring cave dwelling species, *C. badenensis* Nguyen, Orlov & Darevsky, 2006 and *C. nigriocularis* Nguyen, Orlov & Darevsky, 2006 (Fig. 2). Specimens were collected at night (ca. 22–24:00) on the rocky wall in a small cave, approximately 0.5–2.5 m above the ground. Most of the specimens were found inside the cave (ca. 2–5 m from the entrance) and only one was collected outside (ca. 1.5 m away from the entrance). The surrounding habitat was mixed forest of hardwood and vine, dominated by trees of the families Moraceae, Fabaceae, and Dipterocarpaceae. *C. badenensis* and *C. nigriocularis* were also found on rocky cliffs of the cave, usually at heights below 1.5 m above the ground.

## Discussion

A sympatric occurrence of three *Cyrtodactylus* species (*C. phongnhakebangensis*, *C. cryptus* and *C. roesleri*) so far was only reported from Phong Nha-Ke Bang National Park in Quang Binh Province, Central Vietnam (Ziegler *et al.* 2010; Loos *et al.* 2012). However, compared to the situation in Ba Den Mountain, sympatric *Cyrtodactylus* species in Phong Nha-Ke Bang strongly resemble each other phenetically, whereas the three *Cyrtodactylus* species syntopically co-occurring at Ba Den Mountain, i.e., *C. badenensis*, *C. nigriocularis*, and *C. thuongae*, have distinctly different colour patterns. *C. thuongae* has a blotched dorsal pattern versus a banded pattern in *C. badenensis* and a uniformly brown dorsum in *C. nigriocularis*. Concerning scalation, *C. thuongae* also distinctly differs from *C. badenensis* by having more ventral scales (29–44 vs. 25–28), the presence of enlarged femoral scales, the presence of femoral and precloacal pores in males, and the absence of enlarged subcaudals; and *C. thuongae* morphologically differs from *C. nigriocularis* by having a smaller body size (SVL 57.3–77.6 mm vs. 82.7–107.5 mm), the presence of enlarged femoral scales and femoral pores in males, and the absence of distinctly transversely enlarged subcaudals. However, despite distinct morphological appearance, so far there is no difference in microhabitat use discernible for the syntopic cave dwelling species *C. badenensis*, *C. nigriocularis*, and *C. thuongae*, as it is the case for the cryptic *Cyrtodactylus* occurring in Phong Nha-Ke Bang (see Heidrich *et al.* 2007; Loos *et al.* 2012). Thus, future ecological analyses including activity pattern and feeding ecology must show how niche segregation in fact takes place in the endemic cave-dwelling *Cyrtodactylus* from Ba Den Mountain.

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