



### On a bent-toed gecko (*Cyrtodactylus* sp.) from south-eastern Bali, Indonesia

The bent-toed gecko genus *Cyrtodactylus* is a highly diverse reptile genus, well represented across Southeast Asia, as well as the Indian subcontinent and Australia (Uetz & Hallermann 2020). *Cyrtodactylus* species are widely distributed throughout the Indonesian archipelago and recently a new species, *C. jatnai* Amarasinghe *et al.*, 2020, was identified from West Bali. A previous herpetofaunal inventory of Bali only listed *C. fumosus* (Müller, 1895) as the sole representative of the genus (McKay 2006). More recently, Mecke *et al.* (2016b) determined that the name *C. fumosus* refers to a species endemic to Sulawesi and that records elsewhere represent misidentifications and the identity of records from Bali consequently clarified by Amarasinghe *et al.* (2020). A recent study (Janiawati *et al.* 2016) of reptile assemblages in the Gianyar Regency (south-eastern Bali) reported the marbled bow-fingered gecko *C. marmoratus* Gray, 1831, a species found in Java (Mecke *et al.* 2016a) and assumed to occur in Bali by Das (2010). Following the recent description of *C. jatnai*, the only species of *Cyrtodactylus* so far confirmed to occur on Bali, detailed morphological study is required to determine whether *C. marmoratus* is genuinely present on the island.

From 7 to 12 November 2019, we undertook nightly spotlighting surveys for herpetofauna in Singapadu (8°35' S, 115°16' E; alt. 79 m a.s.l.), a village in Sukawati, Gianyar Regency, Bali, Indonesia. Within the village, remnant forest tracts are situated along streams, flanked by agricultural fields, village settlements and temple ruins. Singapadu has a tropical climate, with a mean annual temperature of 26.3°C and mean annual precipitation of 1,895 mm (Source: Badan Meteorologi, Klimatologi, dan Geofisika, Jakarta, Indonesia). The month of November is the warmest time of the year (mean daytime temperature, 27.0°C). Our surveys ranged in

duration from 30 mins to two hours, starting from ~2100 hr on each night and from ~100 hr on 8 and 10 November. Transects were made in forest, riparian and manmade habitats in each survey. We used 400-lumen head torches to search for herpetofauna. Where possible, herpetofauna were photographed at close range using an Olympus Stylus SP-100EE.

Over six nights of surveys, we recorded six species of geckos: *Cyrtodactylus* sp. ( $n=6$ ), *Gekko gekko* ( $n=3$ ), *Hemidactylus frenatus* ( $n=12$ ), *Hemidactylus garnotii* ( $n=5$ ), *Hemidactylus platyurus* ( $n=3$ ), *Hemidactylus* sp. ( $n=156$ ), and some other common herpetofauna from the village and surrounding forest. The *Cyrtodactylus* specimens found may potentially represent either a range extension for *C. jatnai* or an undescribed congener. Among the six individuals (No. 1–6) four were considered adults, one male and three females (Table 1). Specimens were not measured in the field; however those noticeably longer than about 30 mm in SVL were considered adults. In adults, sex was determined through observation for the presence of hemipene bulges in males (Mo 2014). Whether specimens possessed their original tails were determined by observing for a lack of patterning in regenerated tails (Grismer *et al.* 2012).

**Table 1.** *Cyrtodactylus* individuals (No. 1–6) observed during spotlighting surveys; F=female, M=male, A=adult, J=juvenile, O=original, R=regenerated, ? = unknown, F = forest, V = village.

No.	sex	age	tail	Habitat & spot location
1	F	A	O	F, on rock wall
2	M	A	R	V, on ground pavers
3	F	A	R	V, on clay pot
4	?	J	O	F, leaf debris on ground
5	?	J	O	V, on lawn
6	A	A	O	V, on ground pavers

The *Cyrtodactylus* species recorded were all stationary when detected in the spotlight beam. Among the six individuals, two were found in forest habitats, one on a vegetated rock wall

(No. 1) and another on the forest floor amongst fallen leaf fronds (No. 4). The other four individuals were found in village areas, two on the ground (No. 2, 6), one climbing on a clay pot (No. 3) and one on a lawn area (No. 5). The five individuals found on the ground were skittish, moving away when approached. Only the individual found on a rock wall (No. 1) remained stationary until captured. Two individuals (No. 2, 5) displayed mouth gaping while they were being documented. One instance of death-feigning was observed, during which the individual remained on its dorsal surface until we moved off.

These observations suggest that these bent-toed geckos were terrestrial and saxicolous, which would match other *Cyrtodactylus* species that occur on the ground and/or occupy rocky habitats. Furthermore, it would be reasonable to infer that these geckos are well habituated to heavily disturbed remnant forests near human settlements. The forest remnants we surveyed were never further than 50 m from settlements, which reflects the high accessibility of the geckos we recorded. The uncertain taxonomy of these individuals is hence not due to remoteness, but simply the default outcome of a lack of morphological studies of *Cyrtodactylus* specimens in this region. It would therefore be interesting to find out whether these individuals represent *C. jatinai* occurring over a broader range, or an entirely new species yet to be described.

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### Literature cited

Amarasinghe, A.A.T., A. Riyanto, Mumpuni, and L.L. Grismer (2020). A new bent-toed gecko species of the genus *Cyrtodactylus* Gray, 1827 (Squamata: Gekkonidae) from the West Bali National Park, Bali, Indonesia. *Taprobanica*, 9 (1): 59–70.

- Das, I. (2010). *A field guide to the reptiles of South-east Asia*. New Holland, London: 376pp.
- Grismer, L.L., P.L. Wood, and K.K.P. Lim (2012). *Cyrtodactylus majulah*, a new species of bent-toed gecko (Reptilia: Squamata: Gekkonidae) from Singapore and the Riau Archipelago. *The Raffles Bulletin of Zoology*, 60 (2): 487–499.
- Janiawati, I.A.A., M.D. Kusriani, and A. Mardiasuti (2016). Structure and composition of reptile communities in human modified landscape in Gianyar Regency, Bali. *HAYATI Journal of Biosciences*, 23 (2): 85–91.
- McKay, J.L. (2006). *A Field Guide to the Amphibians and Reptiles of Bali*. Krieger Publishing Co., Florida: 146pp.
- Mecke, S., M. Kieckbusch, L. Hartmann, and H. Kaiser (2016a). Historical considerations and comments on the type series of *Cyrtodactylus marmoratus* Gray, 1831, with an updated comparative table for the bent-toed geckos of the Sunda Islands and Sulawesi. *Zootaxa*, 4175 (4): 353–365.
- Mecke, S., L. Hartmann, F. Mader, M. Kieckbusch, and H. Kaiser (2016b). Redescription of *Cyrtodactylus fumosus* (Müller, 1895) (Reptilia: Squamata: Gekkonidae), with a revised identification key to the bent-toed geckos of Sulawesi. *Acta Herpetologica*, 11 (2): 151–160.
- Mo, M. (2014). Habitat selection of the broad-tailed gecko *Phyllurus platurus* in an urban Sydney bushland remnant. *Australian Zoologist*, 37 (1): 95–101.
- Uetz, P. and J. Hallermann (2020). The Reptile Database < <http://reptile-database.reptarium.cz/>>. Accessed on 10 October 2020.

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**Figure 1.** Bent-toed geckos found at Singapadu (Sukawati, Gianyar Regency), Bali (see the individual numbers in Table 1): **(A)** No. 1, **(B)** No. 2, **(C)**, No. 3, **(D)** No. 4, **(E)** No. 5, and **(F)** No. 6. Photo © M. Mo & E. Mo