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An Undescribed Gecko (Gekkonidae: Cyrtodactylus) from Deer Cave, Gunung Mulu National Park, Sarawak, with Comments on the Distribution of Bornean Cave Geckos

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An undescribed gecko (Gekkonidae: *Cyrtodactylus)* from Deer Cave, Gunung Mulu National Park, Sarawak, with comments on the distribution of Bornean cave geckos

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GECKOS of the genus *Cyrtodactylus* are a speciose group in Southeast Asia, with at least nine species known from the island of Borneo (Das & Ismail, 2001; Das, 2006). Of these species, *Cyrtodactylus cavernicolus* has the smallest known range and is therefore the most vulnerable, a status that is reflected in the species having been designated a Totally Protected Species in Sarawak. Confirmed records of *C. cavernicolus* are known only from Niah Cave, located in an isolated limestone block known as the Gunung Subis massif, approximately 13 km^2 in extent. The Niah Cave Gecko is presumed to be dependent on the bat and swift guano ecosystems of the larger cave passages (c.f. Harrison, 1961), and its core habitat may be limited to Niah Great Cave which has some 1 x 10^5" m^2 of passages (data from survey by Wilford, 1964). The only published record of the species from outside the Niah massif is a single record from the Melinau Gorge of Gunung Mulu National Park (Hikida, 1990).

Chapman (1985) reported an observation of a single specimen of a gecko "resembling the Niah Cave Gecko" in Wonder Cave, Gunung Api, Gunung Mulu National Park. The specimen was not collected, and unfortunately is not diagnosable from the published photograph, so its true identity cannot now be established. The Grooved Bent-Toed Gecko, *Cyrtodactylus pubisulcus* is known from Bat Cave, a shallow cave system in the Deer Cave massif, Mulu (Chapman, 1985). More recently, Das et al. (2008) reported the collection of four specimens of an undescribed 'Mulu cave gecko' from Moonmilk Cave, Gunung Api massif, Mulu, and are preparing a formal description.

In July 2008, a gecko was observed and photographed in the dark zone of a high-level passage in Deer Cave (Gua Payau), Gunung Mulu National Park (Fig. 1). Photographic examination confirmed attribution to the genus *Cyrtodactylus* on the basis of slender toes (i.e., lacking distal dilation) and vertical pupils of the eyes. The specimen differs from *C. cavernicolus* and *C. pubisculus* in having a markedly longer tail (tail:body ratio, after correction for photographic angle, = 1.5; *C. cavernicolus* from O'Shea (1985) = 0.7; *C. pubisulcus* = 1.1), and more prominent unbroken, reticulate striping along the whole length of the body. Scale and tubercle counts are not available. Pending formal description of the Moonmilk Cave specimens by Das, we provisionally assign the Deer cave animal to his *Cyrtodactylus* sp. nov.

At the present time, the only published record of *C. cavernicolus* from anywhere other than the Niah Cave massif is that of Hikida (1990; summary of museum specimens, Appendix) based on a single specimen in the Department of Zoology Museum, Kyoto University, Japan (KUZ 12280). If we accept this specimen as *C. cavernicolus,* then it must be concluded that *C. cavernicolus* has a disjunct distribution separated by 100 km of lowland non-karst forest and the major drainage of the Baram River (Fig. 2). *C. cavernicolus* has never been reported from the well-studied caves of Gomantong (Sabah) or Bau (southwestern Sarawak) and can be considered to be genuinely absent at these sites. Karst outcrops at Beluru and Middle Baram have not been intensively studied,

Figure 1. *Cyrtodactylus* sp. nov, Deer Cave, Gunung Mulu National Park.

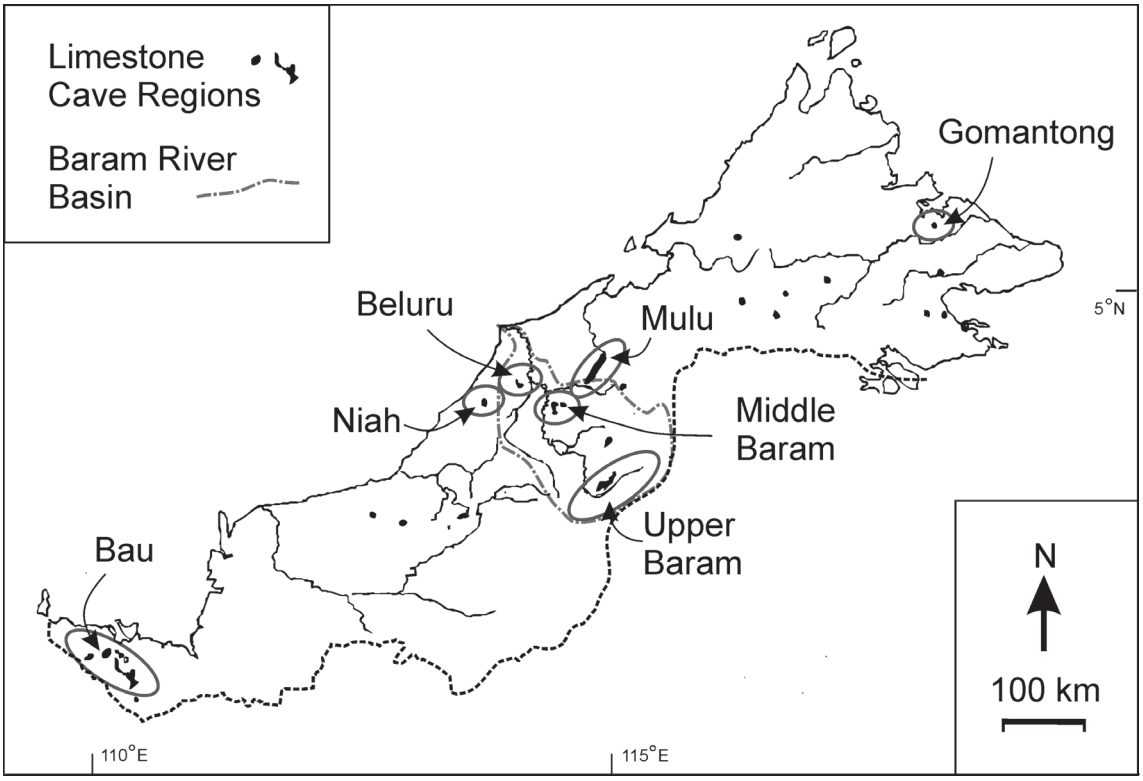

Figure 2. Map of conjectural distribution.

but lie between the Niah and Mulu massifs and would be expected to host *C. cavernicolus* if the species' distribution extended to Mulu. To date, *C. cavernicolus* has not been found in these areas. We therefore propose a more parsimonious hypothesis; that *C. cavernicolus*, the Niah Cave Gecko, is in fact truly endemic to Niah and that specimen KUZ 12280 has been misallocated. Under this scenario, the Mulu cave gecko *Cyrtodactylus* sp. nov Das is considered a Mulu endemic, and probably a sister taxon to *C. cavernicolus* and independently evolved to a troglophilic habit from a common ancestor, perhaps the widespread *C. pubisulcus* which is known to frequent the threshold zone of caves. Investigations of the cave-inhabiting geckonid fauna of the large karst massif at Upper Baram, as well as at Middle Baram and Beluru, can be expected to shed further light on this matter.

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APPENDIX

Type and voucher specimens of *Cyrtodactylus cavernicolus*. Known primarily from the type locality, Niah Great Cave, in northwest Sarawak (lat 3.8667 N, long 113.7333 E). Type specimen is FMNH 128388, paratypes 109955-60, 119904, 119915, 128387-89. CAS 23726 (paratype). Also Niah: BMNH 1984.705; FMNH 1311501-19. LSUHC 4055-56. ZRC 2.5227, 2.5775. Melinau Gorge, Gunung Mulu National Park; KUZ 12280. FMNH: Florida Museum of Natural History, Gainesville. CAS: California Academy of Sciences, San Francisco. LSUHC: La Sierra University, Riverside, California. BMNH: British Museum (Natural History), London. RC: National Museum Singapore, Raffles Museum of Biodiversity Research, Zoological Research Collection. KUZ: Zoological collections, University of Kyoto, Japan.