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AN INVENTORY OF REPTILES OF GUNUNG MULU NATIONAL PARK, SARAWAK, MALAYSIA (BORNEO)

Indraneil Das, Brian Clark, Sue Clark and Ellen McArthur

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We present an inventory of the reptile fauna of Gunung Mulu National Park, Sarawak, East Malaysia (Borneo) based on new collections and observations, and those existing in the literature and specimens in museums. A total of 91 species of reptiles (including one crocodile, five turtles, 41 lizards and 44 snakes) are recorded, significantly increasing the known contents of the reptile fauna of the Park. This list is, however, considered preliminary, and additional effort is expected to reveal the existence of more species, especially those recorded from adjacent areas of Sarawak in similar habitats.

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INTRODUCTION

Gunung Mulu National Park (headquarters at 04.02.30.3N; 114.48.46.1E; 49 m asl; datum WGS84), with over 80 species of anuran amphibians (Malkmus, 2002; Das unpubl.), has the greatest amphibian diversity in the Old World, matching species rich sites in the Neotropics, such as Santa Cecilia in Ecuador (Donnelly, 1994). A large number of the amphibian species of Mulu are, in fact, endemic to these mountain massifs (see Dring, 1983a; 1983b; 1987; Inger *et al.*, 1995). Although the reptile fauna is expected to mirror these results, relatively little is known of this component of the

vertebrate fauna, for the rather scant attention paid during the Royal Geographical Society (RGS) – Sarawak Government Expedition to the Park in 1977-78. A short report on collections is in the grey literature (Dring and Kiew, 1982), and shows 50 species. However, several species were tentative identifications or were identified only to the level of genera. The nomination document to propose the Gunung Mulu area as a Natural World Heritage Site recorded 55 reptile species (United Nations Environmental Programme – World Conservation Monitoring Centre website: URL: www.unep-wcmc.org/sites/wh/gunung_mulu.html; subsequently, cited here as Anon., 1999). Another non-technical work (that of Garbutt, 2006: 169) mentions that “more than 50 species” of reptiles occur in the Park, although it does not provide a listing.

General accounts of the region, including geology, especially the limestone caves, and flora and vegetation, are in Hazebroek and Abang Kashim (2000; 2002). Two special issues of *The Sarawak Museum Journal* (Vol. 30, No. 51, new series, parts 1 and 2, issued in 1982 and 1984), which are multi-authored, cover geology, sociology and invertebrate biology of Gunung Mulu. The earliest zoological collection made in the region was by the German zoologist, Willy Georg Kükenthal (1861-1922), Professor of Zoology at Jena, whose herpetological collections were described by Boettger (1901). The sole reptile collected was the gekkonid lizard, *Gekko monarchus*. The exact collection localities of Kükenthal's Bornean material are not well known, although the gekkonid is specifically recorded from “Mulu”. Kükenthal's Bornean collecting localities were generally in the Sungei Baram region, centred around Marudi (04.11N; 114.19E), although he also collected on the Sungei Tutoh, slightly beyond Rumah Penghulu Bayak (04.00N; 114.29E), *ca.* 25 km SW of Gunung Mulu (see Holthius, 1979).

More recently, collections of lizards were made at Gunung Mulu National Park in the early 1990s by a team of Japanese herpetologist from the Universities of Kyoto and Okinawa, as part of their studies on lizard systematics and genetics (Ota *et al.*, 1991; 1992a; 1992b). During the RGS Expedition, Ian Swingland from the University of Canterbury at Kent studied resource partitioning

patterns of sympatric species of *Draco*, or flying lizards (Hanbury-Tenison and Jermy, 1979); however, the results of these studies remain unpublished.

We provide an annotated checklist of the reptile fauna of the Park and its immediate vicinity, based on our own collections and observations, in addition to literature records and verifiable museum specimens and digital images of colleagues.

MATERIALS AND METHODS

We collected specimens under permit from Sarawak Forest Department and Sarawak Forestry Corporation (see Acknowledgements), between 31 October and 12 November 2006. Images were also recorded of species not collected, and photographs of additional species taken by us and our colleagues who have worked at Gunung Mulu National Park were collated and deposited in the digital image collection of the Raffles Museum of Biodiversity Research, National University of Singapore. For limitations of time and other resources, most collections took place opportunistically, along established trails during all times of the day. Specimens were euthenased with a tricane injection, prior to fixation in 4% formalin for a week and their removal to 70% ethanol for subsequent examination and long-term storage. In addition, we obtained records from the literature and from museum specimens (see listing below).

Institutional abbreviations used include:

BMNH. – The Natural History Museum, London, United Kingdom.

KUZ. – Kyoto University, Department of Zoology Museum, Kyoto, Japan.

SM. – Sarawak Museum, Kuching, Sarawak, Malaysia.

SMF. – Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a.m., Germany.