

# SYSTEMATICS, ECOLOGY AND BIOGEOGRAPHY OF THE GEKKONID GENUS *CNEMASPIS* IN BORNEO (SQUAMATA: GEKKONIDAE)



*Researchers: Mohd Izneil Nashriq and Indraneil Das*

*Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak*

*Cnemaspis* Strauch 1887 is a genus within the family Gekkonidae, comprising ~131 species, including 13 from Africa, 50 in south Asia, and 68 in south-east Asia, and is one of the most speciose Old World gekkonid genera. Morphological adaptation within the genus is conservative, species being relatively small, cryptically coloured, bearing broad, flattened head, large, forward and upwardly directed eyes, flattened body, long widely splayed limbs and long, inflected digits. Bornean *Cnemaspis* are represented by five nominal species- *Cnemaspis kendallii* (Gray, 1845), *Cnemaspis nigridia* (Smith, 1925), *Cnemaspis dringi* Das & Bauer, 1998, *Cnemaspis paripari* Grismer & Chan, 2009 and *Cnemaspis leucura* Kurita *et al.*, 2017. Their habitat ranges from lowland dipterocarp forests to primary and old-growth forest in submontane regions, often within karst, granite or sandstone landscapes. The study is designed to identify Bornean *Cnemaspis* species using a phylogenetic systematic approach, in combination with taxonomy and ecology, looking into their phenotypic differences, and to summarize their ecology and biogeography. It also touches on adaptive radiation, dispersal pattern, habitat fragmentation, and geographical barriers in determining their distribution. Past studies have shown that their distribution as restricted to north-west Borneo, attributed to the existence of ancient rivers of Sundaland. Initial geodispersal analyses reveal fragmented geo formations in north-western Sarawak to hold additional undescribed species, as confirmed by phylogenetic analyses based on mitochondrial NADH dehydrogenase subunit 2 gene (ND2), especially from isolated karst outcrops. Human impacts have led to a number extinction and extirpation of tropical faunas in the recent past. Ergo, the discovery of undescribed species and description of their respective habitat is essential not only to better appreciate the natural history of Borneo, but also to suggest methods for their conservation.

*This research was supported by funding provided by a Niche Research Grant Scheme, from the Ministry of Higher Education, Government of Malaysia, research grant number IA010200-0708-0007*



Map of Borneo, showing distribution of members of the genus *Cnemaspis* within Sarawak State.



*Cnemaspis nigridia*, a granite-scrub specialist endemic to the Gunung Gading region of western Sarawak.