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The Outstanding Geology and Geoheritage of The Niah Caves and Karst Area

Dominique Dodge-Wan
Curtin University Malaysia, Department of Applied Sciences, CDT 250, 98009 Miri, Sarawak, Malaysia.
dominique@curtin.edu.my

ABSTRACT

This paper provides an overview of current information (including research results since 2011) on outstanding geological features of Niah karst region and caves, to support nomination of the property for World Heritage status. The geomorphology visible today is due to geological processes affecting the predominantly Miocene Subis Limestone since uplift: dissolution in vadose and phreatic zones, sediment deposition and removal, mechanical breakdown, speleothem formation and surface weathering. The caves developed at several levels in tropical tower karst (fenglin), with vertical cliffs, swamp notches and a semi-flooded epiphreatic cave network, evidence of ongoing karstification. The walls of relict Traders' Cave have anastomosing ceiling grooves associated with wall notches indicating that it was partially filled with sediment and flow from large streams several times during its formation, prior to more recent mechanical breakdown. The numerous large and complex caves have high aesthetic value, with ceiling skylights and impressive entrances connecting to the surrounding forest. They contain speleothems (stalagmites and stalactites) of types rarely found elsewhere in the world. The Painted Cave holds one of the world's largest cluster of unique crayback-like stalagmites, which are influenced by constructive activity of calcifying cyanobacteria and only form under limited environmental conditions of specific light levels and wind. Microbial activity can also be erosive and is likely responsible for pancake pinnacles and rare photokarren, reported here in Niah for the first time. In addition to their undisputed archaeological, cultural, ecosystems and conservation values, the Niah caves and karst region also have many interesting geological and geomorphological features, some of which are rare and hence have geoheritage value.

Keywords: Niah, karst, fenglin, crayback, pinnacle, photokarren

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