Life from Headwaters to the Coast

NIAH

Biodiversity That Survived Time

Edited by

Jayasilan Mohd-Azlan
Arianti Atong
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Front cover: Oriental Dwarf Kingfisher (*Ceyx rufidorsa*) with a crab (*Geosesarma* sp.). Photo: Chien C. Lee.
Half title: View of the tower karst features of Niah. Photo: Chien C. Lee.
Frontispiece: Niah Cave Gecko (*Cyrtodactylus cavernicolus*). Photo: Chien C. Lee.

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Fig. 1. Floodplain habitat at Niah.

GENERAL ACCOUNT OF FLORA

Meekiong Kalu* and *Mohd Effendi Wasli

Niah National Park, located in Sarawak, Malaysia, is a remarkable site for its archaeological history and diverse ecosystems. Covering approximately 3,140 hectares, the Park is renowned for its limestone hills, rainforests and an intricate network of caves. The climate is tropical, with high humidity and rainfall throughout the year, creating an ideal environment for its flora. Further, the Park's elevational diversity and geology contribute to the distinct vegetation zones present within its boundaries.

The lowland rainforest is the dominant vegetation type in Niah National Park. This zone is characterized by towering trees, such as *Dipterocarpus costulatus, Hopea beccariana, Shorea foxworthyi, Vatica dulitensis* and *Vatica micrantha,* representing the family of dipterocarpus trees, which form a dense canopy. The forest floor is rich with understory plants, including ferns, palms, gingers and orchids. The resultant environment supports a vibrant ecosystem, providing habitats for many animal groups, including monkeys, birds and insects.

Along the rivers and streams that meander through the Park, riparian forests play a crucial role in maintaining the health of aquatic ecosystems. These forests are characterized by a mixture of tree species such as *Saraca, Pometia, Barringtonia* and *Ficus*, which thrive in moist conditions near water sources. The vegetation in riparian zones provides essential habitat for wildlife, stabilizes riverbanks and filters pollutants from runoff, contributing to the overall health of the Park's waterways.

Areas that have experienced disturbance, through human activities, have naturally regenerated into patches of secondary forests. These are characterized by a mixture of pioneer species and younger trees, which create a different habitat compared to undisturbed lowland rainforests. Secondary forests are vital for wildlife, providing food and shelter as they recover over time.

Limestone forests are perhaps the most prominent of the forest types in the Park, aside from being an important archaeological site in Sarawak. Limestone forests differ from other forest types, such as lowland forests, mountain forests, or kerangas forests, in appearance and in the composition of plants found. Limestone forests are only found in limited areas, but many

Fig. 2. Fruits of 'Keruing Kipas', *Dipterocarpus costulatus* (top left); *Epithema sarawakense*, endemic to Sarawak (top right); *Begonia kachack*, endemic to Niah limestone (bottom left); and *Begonia niahensis*, endemic to Niah limestone (bottom right).

plants are specific to these regions and sensitive to environmental changes. The limestone forest plant species richness is attributed to the occurrence of microhabitat differences, including sheer cliffs, boulders, crevices, caves and so on. Many plants are restricted to the limestone forest of the National Park. Several species of *Begonia* and *Epithema sarawakense* thrive in the cracks of the limestone. *Pandanus* and several species of ferns are abundant on the slopes, and two species of *Paraboea* (*P. speluncarum* and *P. culminicola*) are found hanging on sheer cliffs. *Borneocanthus grandifolius*, an endemic species in Borneo**,** grows at the foot of the limestone hills.

Niah National Park boasts a diverse range of endemic and significant plant species, highlighting its ecological importance. Notably, the genus *Begonia* is particularly rich in Borneo, with many species having limited distribution, with nearly 85% of the Bornean Begonias confined in a single location. These plants are easily identified by their asymmetrical leaves, and there are five endemic species in Niah: *Begonia kachak, B. kasutensis, B. niahensis, B. stichochaeta* and *B. subisensis*. They typically flourish in the shaded understory, playing a vital role in the Park's diverse ecosystem.

Fig. 3. *Amorphophallus niahensis*, described from Niah limestone (top left); *Areca gurita*, endemic to Borneo (top right); *Paraboea speluncarum* and *P. culminicola*, both endemic to Niah (bottom left); and *Asplenium phyllitidis*, a litter-trapping lithophyte fern (bottom right).

Then come the orchids. The number of species recorded in the Park is surprisingly lower than those in other limestone areas of Sarawak. In all, 21 genera, with 32 karst species have been documented, reflecting a similar trend observed in other locations, where *Bulbophyllum* and *Dendrobium* are the most prevalent genera. Additionally, several Borneo-endemic orchid species have been found in the Park, such as *Adenoncos triloba, Didymoplexiella borneensis* and *Dossinia marmorata.*

The family Araceae, which includes genera such as *Alocasia, Amorphophallus, Homalomena* and, *Rhapidophora,* is well-represented in the Park. Aroids are known for their unique leaf shapes and structures, often thriving in the humid, shaded environments of the rainforest. Some species have fascinating inflorescences that play a role in attracting pollinators, further enhancing the ecological complexity of the Park.

These endemic and notable species not only enrich the biodiversity of Niah National Park but also play essential roles in their respective ecosystems, contributing to the overall health and stability of the environment. The diverse vegetation of the Park plays a critical role in maintaining the ecological balance of the region. In addition to providing vital habitat for many animal species, rainforests also serve as carbon sinks and aid in local climate regulation. The riparian forests contribute to water quality and stability, showcasing the interconnectedness of the Park's ecosystems.

Recognizing the ecological and cultural importance of Niah National Park, conservation efforts are underway to protect its unique vegetation and biodiversity. Initiatives include sustainable tourism practices, reforestation projects and community engagement to promote environmental awareness. These efforts are essential for preserving the Park's natural heritage for future generations. Niah is a treasure trove of biodiversity, with its varied vegetation and unique plant life contributing to the ecological richness of Borneo. The preservation of this remarkable environment is vital not only for the flora and fauna that inhabit it but also for the cultural heritage of the region. As we continue to explore and appreciate the wonders of Niah National Park, we must commit to protecting this invaluable resource for the future.

CONTRIBUTOR AFFILIATIONS

Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak
Indraneil Das, Rory Dow, Jongkar Grinang, Hans Hazebroek, Sally Soo Kaicheen, Chien C. Lee, Jayasilan Mohd-Azlan, Muhd Amsyari Morni, Izneil Nashriq, Jeffrine J. Rovie-Ryan and Heira Vanessa.

Faculty of Resource Science and Technology, Universiti Malaysia Sarawak
Mohamad Hasnul Bolhassan, Meekiong Kalu, Mohd Effendi Wasli, Siti Nurlydia Sazali, Ratnawati Hazali, Chai Chia Yee, Nurfarida Anum Zainaddin, Tan Wei Lim, Chow Jia Yii, Marlina Bianah Soui, Chum Yit Seng, Nur Asya Aliah Mohd Baki, Nur Asha Irdina Mohd Najib, Ma Ming Hui and Mohamad Jalani Mortada, Jie Ying Lee, Mohd Effendi Marzuki, Camilia Yen Ak Richard, Mohd Zacaery Khalik, Nur Iylia Maisarah Baharom, Muhammad Danish Haqeem Mohd Khairi, Asfa Hanis Mohamad Azmi, Muhammad Amin Iman Azmi, Victor Lee Sien, Mohamad Fizl Sidq, Faisal Ali Anuar Ali Khan and Ramlah Zainudin.

Sarawak Forestry Corporation
Haidar Ali, Abang Arabi Abang Aimran, Arianti Atong, Shirley Lyn Michael Gias, Januarie Kulis, Nadia Ezzana Hashim and Taha bin Wahab.

Sarawak Museum
Mohammad Sherman Sauffi and Wong Siew Fui.

Swinburne University
Dominique Dodge-Wan.

Navin Officer Heritage Consultants and School of Biological, Earth and Environmental Sciences, University of New South Wales
Darren Curnoe.

Universiti Malaya
Lim Tze Tshen.

School of Archaeology & Anthropology, Australian National University
Philip Piper.

Institute for Tropical Biodiversity and Conservation, Universiti Malaysia Sabah
Jaya Seelan Sathiya Seelan.

McDonald Institute for Archaeological Research, University of Cambridge
Graeme Barker.

Griffith Centre for Social and Cultural Research, Griffith University
Paul S.C. Taçon.

University of the Ryukyus
Ichiro Miyagi and Takako Toma.

Kanazawa University
Takao Okazawa.

School of Geography and Ocean Science, Nanjing University, Nanjing, China
Xuefeng Sun

Private
S.G. Butler, Earl of Cranbrook, Lim Chan Koon, Katherine Pierce and Graham T. Reels.

ABOUT THE SERIES

'Life from Headwaters to the Coast' is a series of illustrated guides to the biological diversity of the State of Sarawak, published by the Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak (UNIMAS).

Starting in 2015 with Tanjung Datu National Park, with support from the Niche Research Grant Scheme of the Ministry of Higher Education, Government of Malaysia, the production of subsequent volumes in the series have been funded by governmental and non-governmental agencies.

The volumes cover geology, flora and fauna as well as sociological aspects of areas covered and are written by specialists, including staff, students and associates of the Institute, the Faculty of Resource Science and Technology in UNIMAS and other experts when relevant, with naturalists, students, conservationists, administrators and decision-makers in mind.

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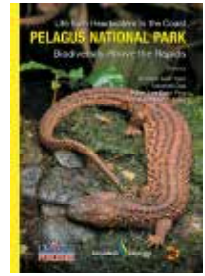

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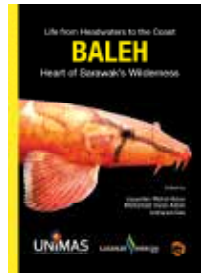

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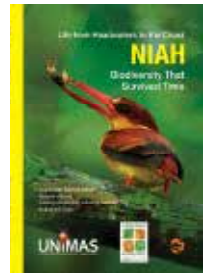

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