Life from Headwaters to the Coast

NIAH

Biodiversity That Survived Time

Edited by

Jayasilan Mohd-Azlan
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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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ORCHIDS

Heira Vanessa Nelson* and *Meekiong Kalu

Orchids, belonging to the family Orchidaceae, are a remarkable group of flowering plants, primarily found in tropical regions that are characterized by high annual precipitation and minimal seasonal variation. Renowned for their floral diversity and unique forms, orchids are among the most advanced of monocotyledons. Malaysia is particularly rich in orchid species, with an estimated 972 species in Peninsular Malaysia and approximately 3,000 species in Borneo. These plants exhibit two growth patterns — sympodial and monopodial — and can thrive in terrestrial, epiphytic, lithophytic and saprophytic habitats. The island, with 10% of the world's total, is considered a centre of diversity for the group.

Peninsular Malaysia records 972 species in 159 genera of orchids, of which about 20% are endemic. Sabah and Sarawak harbour about 3,000 species of wild orchids, with Gunung Kinabalu, alone being home to about 2,000 species and Sarawak, about 1,000 species. Covering an area of 31.4 km square, Niah National Park is one of Sarawak's smallest national parks. Its uniqueness for paleontological studies and a diversity of ecosystems has attracted visitors, naturalists and scientists for the past decades. The Park lies 16 km inland from the sea on the north coast of Sarawak and covers lowland forests and limestone hills. The diverse ecosystems of protected forests promise a large number of orchids and presence of rare species. Ongoing research and conservation efforts have likely led to discovery of new species, further enriching Sarawak as biodiversity hotspot. Given its unique ecological conditions, the State remains a critical area for orchid diversity. This is an increase of about 40%, suggestive of about 27 species discovery annually. The increase suggests more discoveries through botanizing new forests areas and systematic rescue program in logging concessionaries, new hydro-dam sites and other major infrastructure development.

Members of the Orchidaceae are protected under the Sarawak Wild Life Protection Ordinance, 1998. Many are threatened due to habitat destruction and indiscriminate collection. They are important for biodiversity conservation and potentially producing an array of therapeutic substances, nutritious food and ornamental plants. Nonetheless, orchids are one of the most threatened families yet most challenging to conserve due to their complex biology and life history strategies.

Unlike other limestone forest areas in Sarawak, which have a relatively high orchid diversity (at least 120–150 species), it is surprising that the Niah limestone forest records a relatively low number of orchids, with only 50 species recorded (see Checklist). Causal factors remain uncertain and may include conversion of adjacent forests into agricultural land, particularly for oil palm cultivation. Nevertheless, the number of genera recorded is high and the presence of species such as *Anoectochilus* cf. *longivalcaratus, Didymoplexiella borneensis* and *Geesinkorchis alaticallosa* make the Niah limestone forest significant for conservation.

Fig. 1. Representatives of the genus *Bulbophyllum* in Niah National Park. (A) *Bulbophyllum purpurascens* and (B) *Bulbophyllum* sp.

The genus *Bulbophyllum* is probably the largest genus within the Orchidaceae, with over 2,167 species. Borneo is home to about 305 species, with over 150 species endemic to the island. Typically, they have sympodial rhizomes that either creep or hang loosely, with distinct or inconspicuous O000 new shoots and inflorescence usually arise from a node below the pseudobulb, and the inflorescence culminates in one to many flowers and the labellum is mobile (being hinged to the column foot). Most species are epiphytic, being robust and drought resistance. A total of nine *Bulbophyllum* species have been recorded in Niah National Park and the adjacent headquarters area. With many areas unsurveyed, particularly the limestone slopes, the number of species is suspected to be higher.

Fig. 2. (C) *Claderia viridiflora;* (D–E) *Dendrobium* spp. and (F) *Cymbidium finlaysonianum*.

Epiphytic orchids are usually characterized by succulent leaves, with thick cell walls, cuticles and sunken stomata, whereas terrestrial orchids possess rhizomes, corms or tuber, and are largely confined to the tropics and subtropics. They may grow on other plants, usually trees without extracting nutrients from their hosts, and instead, obtain water and nutrients from rain, air and decaying matter. *Cymbidium* orchids are highly valued for their exotic flowers and medicinal values. They grow as epiphytes and are rarely leafless and usually pseudo-bulbs. *Cymbidium finlaysonianum* (Fig. 2F) is an epiphytic orchid and a native to Borneo, Java, Cambodia, Thailand, Philippines, Vietnam and Peninsular Malaysia.

The genus *Bromhedia* comprises terrestrial sympodial orchids with long, slim but tough stems bearing numerous leaves. Plants with leaves that are horizontally flattened look rather like bamboo or grass, hence their common name, 'Grass Orchids'. *B. finlaysoniana* is a terrestrial orchid growing in

open dry places, as well as lowland forests of Malaysia. Other examples of terrestrial orchid found in Niah National Park are *Plocoglottis acuminata* and *P. borneensis*.

Plant conservationists are particularly interested in orchids due to their high species richness and reliant on one or more biotic interactions, which can offer hurdles to their conservation. As a result, initiatives should be made to establish, promote and enforce appropriate legislation and explicit regulations that relate to threats to protect wild orchids and reintroduction efforts should be expanded nationwide to secure wild populations.

Checklist

Summary of orchid species recorded in the Niah region (status: IUCN Red List of Threatened Species: LC = Least Concern; and NE = Not Evaluated). * indicates that species is endemic to Borneo.

No.	Species	Conservation status (IUCN 2025)
1.	*Adenoncos triloba* Carr.	NE
2.	*Agrostophyllum glumaceum* Hook. *f.*	NE
3.	*Agrostophyllum majus* Hook. *f.*	NE
4.	*Anoectochilus* cf. *longivalcaratus* J.J. Sm.	NE
5.	*Appendicula anceps* B1.	NE
6.	*Appendicula uncata* Rild. ssp. *sarawakensis* J.J. Wood	NE
7.	*Bromheadia finlaysoniana* (Lindl.) Miq	NE
8.	*Bulbophyllum acuminatum* J.J. Sm.	NE
9.	*Bulbophyllum acutum* J.J. Sm	NE
10.	*Bulbophyllum catenarium* Ridl.	NE
11.	*Bulbophyllum dibothron* J.J. Verm. & A. Lamb*	NE
12.	*Bulbophyllum medusae* (Lindl.) Rchb. *F*	NE
13.	*Bulbophyllum minitulum* Ridl. *	NE
14.	*Bulbophyllum phaeoneuron* Schltr.	NE
15.	*Bulbophyllum thymophorum* J.J. Verm. & A. Lamb*	NE
16.	*Bulbophyllum vaginatum* (Lindl.) Rchb. *F*	NE
17.	*Calanthe triplicata* (Willemet) Ames	NE
18.	*Coelogyne pandurata* Lindl.	NE
19.	*Coelogyne verrucosa* S.E.C. Sierra	NE
20.	*Corymborkis veratrifolia* Hook. *f.*	NE
21.	*Claderia viridiflora* Hook. *f.*	LC

No.	Species	Conservation status (IUCN 2025)
22.	*Cylindrolobus leptocarpus* (Hook. *f.)* J.J. Wood [syn: *Eria leptocarpa* Hook. *f.*]	NE
23.	*Cylindrolobus longerepens* (Ridl.) Rauschert [syn: *Eria longerepens* Ridl.]	NE
24.	*Cymbidium finlaysonianum* Lindl.	NE
25.	*Cystorchis aphylla* Ridl.	NE
26.	*Dendrobium aloifolium* (B1.) Rchb. *f.*	LC
27.	*Dendrobium crumenatum* Sw.	NE
28.	*Dendrobium concinnum* Miq.	NE
29.	*Dendrobium kiauensis* Ames & C. Schweinf.	NE
30.	*Dendrobium leonis* (Lindl.) Rchb. *f.*	NE
31.	*Dendrobium secundum* (B1.) Lindl.	NE
32.	*Didymoplexiella borneensis* (Schltr.) Garay*	NE
33.	*Dossinia marmorata* E. Morren*	NE
34.	*Geesinkorchis alaticallosa* (de Vogel) M.W. Chase & Schuit.	NE
35.	*Liparis condylobulbon* Rchb. *f.*	NE
36.	*Liparis condylobulbon* Lindl.	NE
37.	*Liparis gibbose* Finet	NE
38.	*Liparis* cf. *grandiflora* Ridl.	NE
39.	*Liparis wrayi* Hook. *f.*	NE
40.	*Malaxis andersonii (*Ridl.) Ames.	NE
41.	*Oberonia macrostachys* Ridl.	NE
42.	*Plocoglottis acuminata* B1.	NE
43.	*Plocoglottis borneensis* Ridl. *	LC
44.	*Podochilus lucescens* B1.	NE
45.	*Podochilus* cf. *serpilifolius (*B1.) Lindl.	NE
46.	*Robiquetia spatulate* (B1.) J.J. Sm.	NE
47.	*Strongyleria leiophylla* (Lindl.) Schuit., Y.P. Ng & H.A. Pedersen	NE
48.	*Thecostele alata* (Roxb.) C.S. Parish	NE
49.	*Thrixspermum squarrosum* J.J. Sm.	NE
50.	*Trichotosia vestita* (Wall *ex* Lindl.) Kraenzl	NE

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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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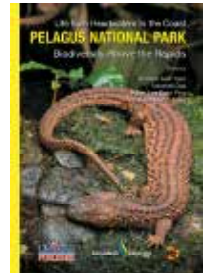

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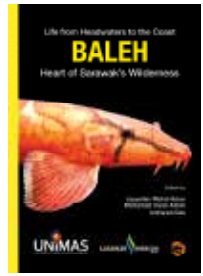

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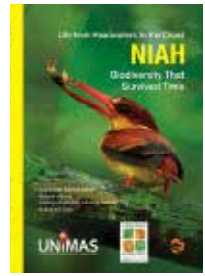

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