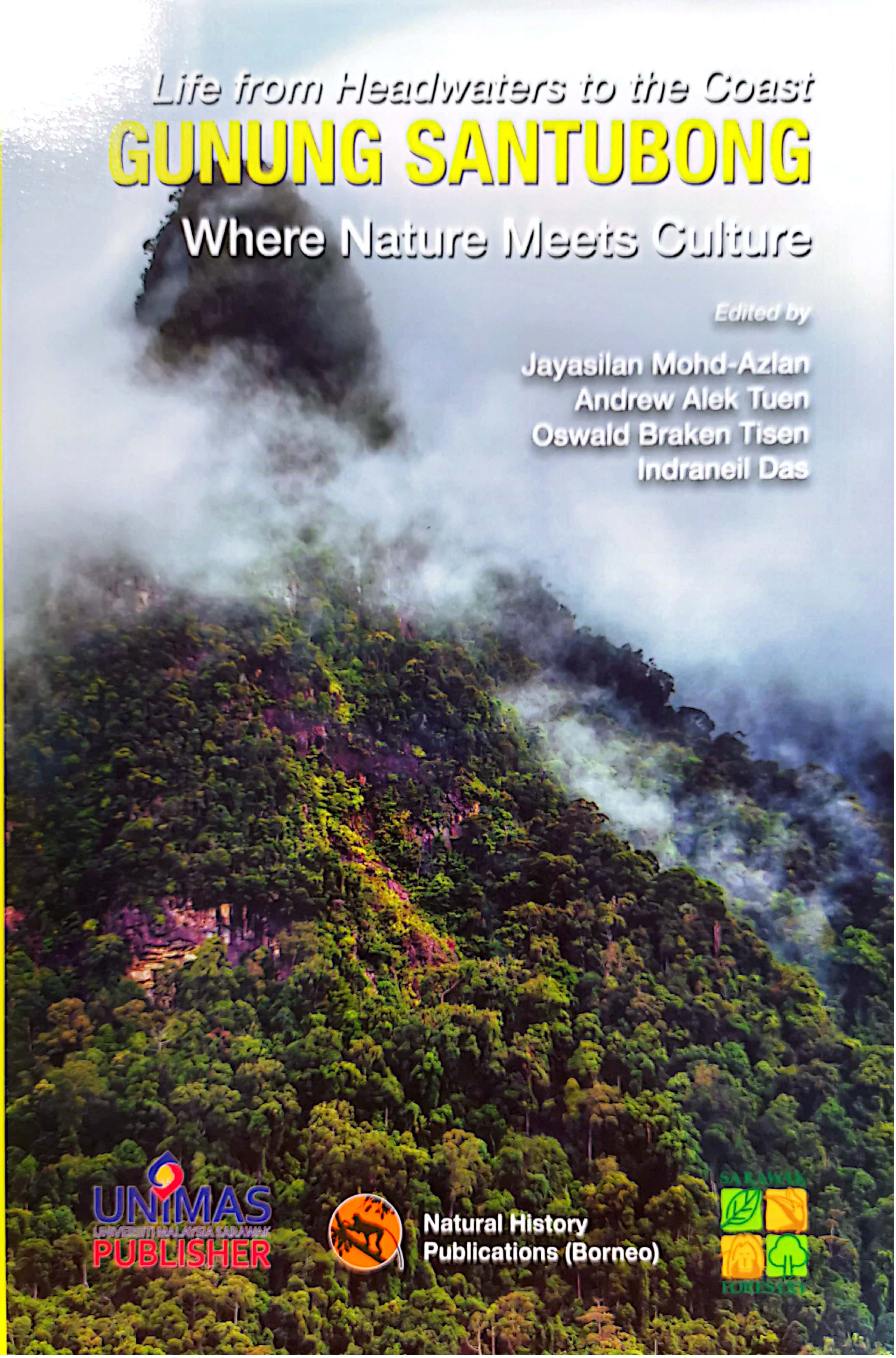

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GUNUNG SANTUBONG

Where Nature Meets Culture

Edited by

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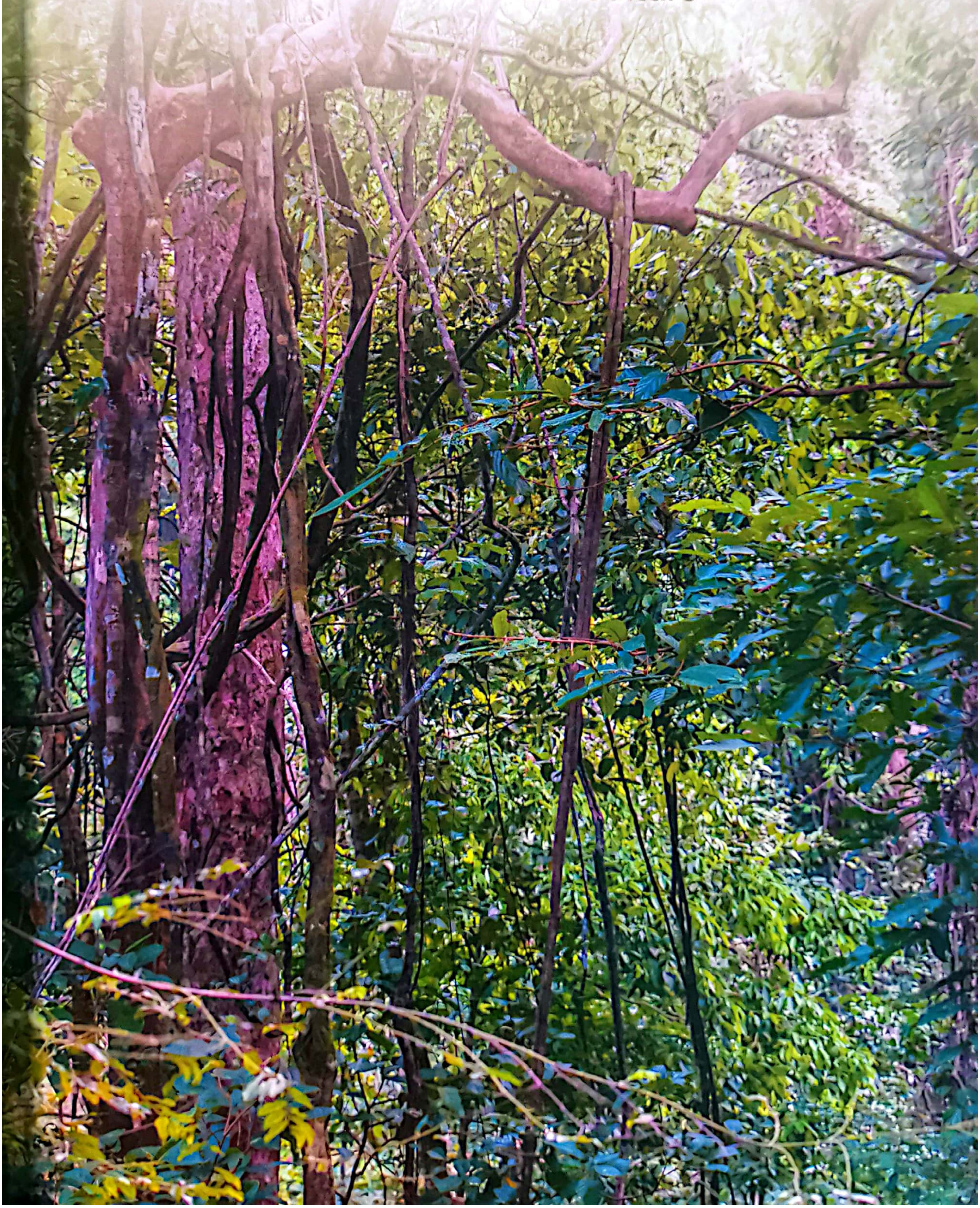

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Life from Headwaters to the Coast:
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Front cover: A partially cloud-covered summit region of Gunung Santubong. Photo: Hans Hazebroek.
Half-title page: Much of the lower flanks of Gunung Santubong is covered in tall, mixed dipterocarp forest. In places, this forest is rich in lianas, that can form tangles connecting several trees together, as seen in this image. Photo: Hans Hazebroek.
Frontispiece: A bird's eye view of Gunung Santubong. Photo: Chien Lee.

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Contents

HUMAN DIMENSIONS

FOREWORD

The Santubong Peninsula is strategically situated in close proximity to the State Capital of Kuching. Oldtimers and long-term residents are aware of this hidden gem of a nature reserve, that offers to weary city-dwellers, peace and tranquility. Apart from a curious mix of warm sea breeze with crisp mountain air, Santubong offers field naturalists and trekkers outstanding views of rainforest, that is home to many unique species of Bornean lowland flora and fauna.

Recognizing the important role of biodiversity, the State government has initiated measures to mitigate impacts and facilitate its protection and conservation. The forested interior of Santubong Peninsula, where diverse habitats are found, support numerous species of plants and animals, some of which are Bornean endemics, or one of conservation importance. In the current socio-politic climate, it is important to highlight economic value of biodiversity and ecosystem services. Raising awareness on our natural heritage is an important step in achieving both national and international biodiversity conservation targets and reducing biodiversity loss, through safeguarding of our ecosystems.

UNIMAS has put biodiversity and environmental conservation at the forefront of its research agenda, and is one of the three research pillars of the young university's niche area. Recognizing its strength, both in resources and expertise, the Ministry of Higher Education, Government of Malaysia, has awarded UNIMAS a generous grant from the Niche Research Grant Scheme (NRGS) to facilitate research and conservation awareness of the biodiversity of western Sarawak.

UNIMAS being located in Sarawak, with its vast wealth of biodiversity and a multi-ethnic population, its academics collaborate with local communities, governmental and non-governmental agencies, as well as national and international researchers to study and conserve tropical biodiversity, in its efforts to raise awareness on conservation and management.

The publication is the result of such collaborative work with State agencies of Sarawak, such as the Sarawak Forestry Corporation, Forest Department Sarawak, and other national bodies, such as Universiti Malaysia Sabah. Our researchers are passionate about their work and tireless in communicating. With this in mind, this richly-illustrated book was brought together to capture the uniqueness and beauty of Santubong Peninsula, targetting the general public, especially students, researchers, natural resource managers and ecotourists to the State.

It thus gives me great pleasure to write the Foreword to this informative book, containing 22 chapters on various aspects of biodiversity of Santubong Peninsula. I congratulate the authors for writing a lucid account of their often-technical work for a lay audience. In the beauty of the flora and fauna depicted through the photographs here, I hope city-dwellers can appreciate an important part of our Sarawak heritage. I hope this volume will be useful to all stakeholders, be it the business sector or the wider public, to all of whom we remain connected through our reliance on biodiversity.

Prof. Datuk Dr. Mohamad Kadim Suaidi
Vice Chancellor
Universiti Malaysia Sarawak

PREFACE

Sarawak is located in one of the world's megadiversity regions of Sundaland, and is home to a vast variety of forests, from mangrove forests in the lowlands to the cloud forests on mountaintops, where unique habitats harboured are home to some of the world's rarest and most threatened species.

Biodiversity is one of the top National agenda, whereby the National Policy on Biodiversity 2016–2025 was formulated to conserve the country's biodiversity and to ensure that its components are safeguarded without hindering the progress and socio-economic development of the nation and its people. Recognizing a paramount need for biodiversity conservation, the Ministry of Higher Education, Government of Malaysia, under its inaugural Niche Research Grant Scheme (NRGS), awarded Universiti Malaysia Sarawak a grant, entitled "Biodiversity of western Sarawak: Life from headwaters to the coast". This project sits within the University's niche area in biodiversity and environmental conservation, and aims to investigate the patterns of species and regional habitat diversity, from western tip of Borneo to the south-west of Sarawak. Within the auspices of this project, a series of scientific expeditions were carried out in 2014–2018, complementing the ongoing long-term research in the Santubong Peninsular.

Many of the charismatic species are known to occur only in totally protected areas, which includes Santubong National Park, located in the Santubong Peninsula. Knowing the distribution of species in a dense tropical rainforest has always been a challenging undertaking. These information, however, are essential in understanding the ecology of tropical rainforests, which is important in the design and implementation of management plans for protected areas. Santubong National Park, endowed with a lush forest cover, naturally is home to a diverse flora and fauna, and a backdrop of mountains overlooking the sea, offers ecotourism potential. Tourists can trek the forest trails, do birdwatching and encounter rainforest mammals, and visit the waterfalls, and can get a chance to watch whales and dolphins on the sea-facing side of the mountain.

This third exploration marks the progress of a five-year project that started in 2014 in Tanjung Datu National Park, Gunung Penrissen in 2016 and will continue eastwards in the following year. This well-illustrated volume is thus part of series of publications on the targeted study areas within western Sarawak.

The geology and geomorphology chapter reveals interesting facts on the origin and evolution of the geological features of the Santubong area. The chapter sets the scene for the archeology, history and legends of Santubong Peninsula. The floral components demonstrate the richness of the herbaceous flora and tree species.

The fauna studied include the macroinvertebrates, insects, molluscs, fishes, frogs, lizards, snakes, birds, bats, rodents, shrews and larger mammals. Information on how anthropomorphic activities relate to biodiversity is also a part of the research, where the dependence of humans on natural resources is highlighted, demonstrating how we fit into the mosaic of a natural landscape.

The human and social component describes the use of natural resources by local communities, and a chapter on ecotourism enumerates how biodiversity, geological and cultural features of the site can benefit the State's effort to promote tourism.

An e-biodiversity platform would ultimately be made available for all the sites covered under the project, synthesizing the data and technologies developed during the project.

We intend to present the significant results of the research for local stakeholders, management authorities and for the general public. It is hoped that nature enthusiast and those who are interested in tropical biodiversity will find this book informative. Finally, we hope that this work will help enhance knowledge and awareness on a national heritage site.

Wan Hashim bin Wan Ibrahim
Vice Chancellor (Research and Innovation),
Universiti Malaysia Sarawak

Haji Zolkipli Mohamad Aton
Chief Executive Officer,
Sarawak Forestry Corporation Sdn Bhd

Haniffia santubongensis (Zingiberaceae)

Wong Sin Yeng

Haniffia is a genus of four described species of terrestrial gingers, restricted to the far south of Thailand, Peninsular Malaysia, and Malaysian Borneo. All are seemingly locally endemic. The type species, *H. cyanescens* (Ridl.) Holttum, is restricted to Bukit Tanga (Negeri Sembilan, Peninsula Malaysia), with a variety, *H. cyanescens* var. *penangiana* C.K. Lim, occurring on Pulau Pinang and Kedah. The most recently recognized species, *H. flavescens* Y.Y. Sam & Julius (Sam et al. 2009) is known only from Endau Rompin N.P. (Johor, Peninsula Malaysia). The sole extra-Malaysian species, *H. albiflora* K. Larsen & J. Mood, is confirmed only from Nam Tok Chatwarin, Naratiwat, Thailand.

Haniffia santubongensis represents a new generic record for Borneo, to where it is locally endemic to Gunung Santubong (Wong et al. 2014). Combined with the three also locally endemic species in Peninsular Malaysia and the far south of Thailand, it provides further compelling evidence that these *Haniffia* species, along with numerous other examples in families as diverse as the aroids, the palms, Rubiaceae, and the genus *Hanguana*, represent relictual fragments of the Riau Pocket phytochore (Ashton 2005; Corner 1960).

Haniffia santubongensis S.Y.Wong, I.H.Ooi & P.C.Boyce, Type:—Malaysia, Kuchi[illegible] Gunung Santubong, Summit Trail, just after F4, 04 44 12.1 N 110 19 30 [illegible], 2 Sept. 2005, *P.C.Boyce & S.Y.Wong ZI-22* (holo SAR; iso SAR (spirit [illegible] RIM (spirit)).

Diagnostic characters.— *Haniffia santubongensis* most closely resembles *H. cyanescens* var. *cyanescens* (Negeri Sembilan) but is readily distinguished by the oblique-tipped bifid lateral staminodes, and labellum distally notched (not deeply split) with a yellow callus extending from the entrance to the basal spur to the innermost extent of the lip distal division.

Description.— Terrestrial clumping herb ca 50 cm tall; *rhizomes* ca 10 mm diam., shallowly buried in soil; roots fibrous. *Leafy shoots* 5–25 per clump, closely spaced, up to 50 cm tall,, composed of leaf sheaths, base ca 1cm diam.; *leafless sheathes* ca 6 per shoot, occupying the lower

1/3–1/2, reddish, glabrous, membranous on apex and margi 10–20 per shoot, sub-sessile; *ligule* obtuse to almost truncat emarginate, ca 3 mm long, soon turning black, glabrous; *petio* *lamina* narrowly elliptic to lanceolate, 8.5–15 × 2.5–3cm, bas apex acuminate, acumen 6–20 mm long, glabrous, bright green slightly paler with deep green slender primary lateral veins. *Inflo* borne at base of leafy shoot, usually solitary, rarely two tog cm long, with ca 5 flowers per inflorescence, peduncle to 3.5 reddish where exposed, otherwise pale green, basal sheaths cm, pink. *Bracts* boat-shaped, 15–25 × 6–10 mm, spiral, mer reddish green, glabrous, each subtending one flower. *Caly* 20–30 mm long, apex unequally tridentate, greenish, transluc at tip. *Floral tube* 36–70 mm long, greenish white, slightly g hairy inside and out. *Dorsal corolla lobe* elliptic, 20–26 × c membranous, greenish white with darker veins. *Lateral coro* narrowly elliptic, 20–25 × ca 4 mm, membranous, greenish w darker veins. *Lateral staminodes* spatulate, apex oblique bifid, 4–6 mm, greenish white with darker veins, both surfaces cove dense, greenish white glandular hairs. *Labellum* obovate, 21–25 mm, swollen at base where staminodes is adenate, apex distally distal lobes curved downwards, white with blue staining, lobes purple-blue, centrally with a yellow median callus, upper surface with dense, white glandular hairs, lower surface sub-glabrous white, covered with dense, glandular hairs; filament 5–6 mm lon 6–10 mm long; anther crest 2–2.5 mm long, apex bidentate, wh 46–54 mm long, glabrous; stigma cup-shaped, ca. 1.8 mm long *Ovary* 3-locular, ovules many. *Epigynous glands* 2, free, linear, 2- long, yellow. *Fruit* capsule, dehiscent, somewhat 3-sided, glob prominent terminal floral remains, ca. 2 × 2 cm, semi-glossy br heavily stained with reddish brown speckles on a cream base, very sparsely warty, splitting longitudinally into 7 valves, valve usually with 3-locules well developed. *Seeds* ellipsoid-obovoid 3–4 mm, glossy brown, turning greyish-black, aril thick, whi fresh.

Ecology.— Partially shaded deep sandy peat podzols of ridge kera *Dryobalanops*-dominated hill forest; ca 200–250 m asl.

Distribution.— *Haniffia santubongensis* is known only from the type l where it occurs as two separate, dense, populations.