



# BUNGO RANGE

**BIODIVERSITY AND COMMUNITY**

EDITORS

GABRIEL TONGA NOWEG  
FAISAL ALI ANWARALI KHAN  
JONGKAR GRINANG



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Published in Malaysia by  
UNIMAS Publisher,  
Universiti Malaysia Sarawak,  
94300 Kota Samarahan,  
Sarawak, Malaysia.

Printed in Malaysia by

Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

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# FOREWORD

I am glad to note that this publication is another excellent milestone from Universiti Malaysia Sarawak through the Institute of Biodiversity and Environmental Conservation, in particular exploring and documenting the rich biodiversity and community in Sarawak. The biodiversity and environmental conservation is one of three niche areas of the university, which recognise the need to balance the biodiversity, habitats and human development. As such, the Research Innovation and Enterprise Centre, the university's centre responsible for research and innovation, has actively facilitated and supported research activities, and publications in various platforms available to scientific communities and the public.

I would like to thank staff of the Institute of Biodiversity and Environmental Conservation for continuously conducting good research and documenting crucial information that benefits many users including scientists across the region. It is well in line with the Institute's vision to become a leading center for research in tropical biodiversity and environmental conservation in Borneo and Southeast Asian region. I would like to congratulate the editors for their efforts in compiling and editing the data resulted from a multidisciplinary expedition in Bungo Range in December 2017 into a well indexed research book. I do believe that each article in this book serves its purpose as an important reference to academics, policy makers as well as public audiences. In particular, the findings would be a useful reference for the management plan of Bungo Range National Park that was gazetted on 26 February 2009.

To materialise the multidisciplinary expedition and the publication, the Institute had collaborated with various state agencies and local communities. Therefore, I am acknowledging their support and contribution (both financial and in-kind) to this project. They are Forest Department Sarawak, Sarawak Forestry Corporation,

Sarawak Biodiversity Centre, Sekolah Kebangsaan Tringgus, Pejabat Pendidikan Daerah Bau, Bau District Office, Bau District Council, Klinik Kesihatan Krokong, Bau District Police, Bau Fire and Rescue Station, Bau Hospital, and villagers from Tringgus settlement namely, Kg Bong, Kg Rotan and Kg Nguan. I hope similar collaborative efforts will be pursued in the near future to other protected areas in Sarawak.

To the authors, UNIMAS Publisher, and those who are involved in this publication, keep up with the good team spirit.

Finally, thank you for inviting me to pen my message in this great reading material.

**Prof. Dr. Wan Hashim bin Wan Ibrahim**  
**Deputy Vice Chancellor (Research and Innovation)**  
**Universiti Malaysia Sarawak**

# PREFACE

This publication marks another significant output of the collaborative works between Universiti Malaysia Sarawak and Forest Department Sarawak on biodiversity study and conservation in the State.

In this book, the findings of multidisciplinary expedition to Bungo Range in December 2017 were compiled into 24 chapters covering biodiversity, environment and community under the theme “Bungo Range - Biodiversity and Community”. The theme signifies the importance of the pristine mountainous forest of the Bungo Range that supports rich species of flora and fauna, and the uniqueness of community and their customs as well as cultures. The involvement of academics, researchers and the villagers in the expedition has enhanced the exchange of knowledge, skill, and experience among the stakeholders, which are reflected in this book. In particular, the participation of the villagers in the expedition had indirectly conveyed the message of the Forest Department Sarawak on the importance of conserving the forest of Bungo Range and preserving local cultures. Ironically, the Bungo Range is becoming a popular tourism destination due to the outstanding sceneries such as mountains, waterfalls, reservoir, and the cultures (e. g., the last ring ladies). Indeed, this book will serve as a useful reading material for researchers, scientists and non-government organization in their research endeavour.

We would like to congratulate the editors, authors and those who contributed to the production of this book. We wish similar outputs shall be achieved from future collaborative work between Universiti Malaysia Sarawak and Forest Department Sarawak. Specifically, we would like to thank the community leaders and heads of department in Bau District for their support throughout the project. Yang Berhormat Miro Simuh for his strong supports of the expedition and launching of the event on 5<sup>th</sup> December 2017.

We hope this book serves the needs of the audiences either as academic reference or reading material in leisure time. Happy Reading!

**Prof. Dr. Mohd Azlan Jayasilan**

Director  
Institute of Biodiversity and  
Environmental Conservation  
Universiti Malaysia Sarawak

**Datu Hamden Haji Mohammad**

Director  
Forest Department Sarawak

# INTRODUCTION

Sarawak government has voluntarily set aside more than 2.6 million hectares of lands and water bodies as conservation areas under the Heart of Borneo (HOB) Initiatives. The Sarawak's HOB area stretch from the north in Limbang Division to the south at Tanjung Datu that boundaries with Sabah, Brunei and Kalimantan, Indonesia. Of the total HOB area, approximately 441,000 hectares are totally protected area comprising national parks, wildlife sanctuaries and nature reserves. The southern part of the HOB contains 10 protected areas many of which are tourism hotspots such as Bako National Park, Kubah National Park, Gunung Gading National Park, Matang Wildlife Centre and Tanjung Datu National Park.

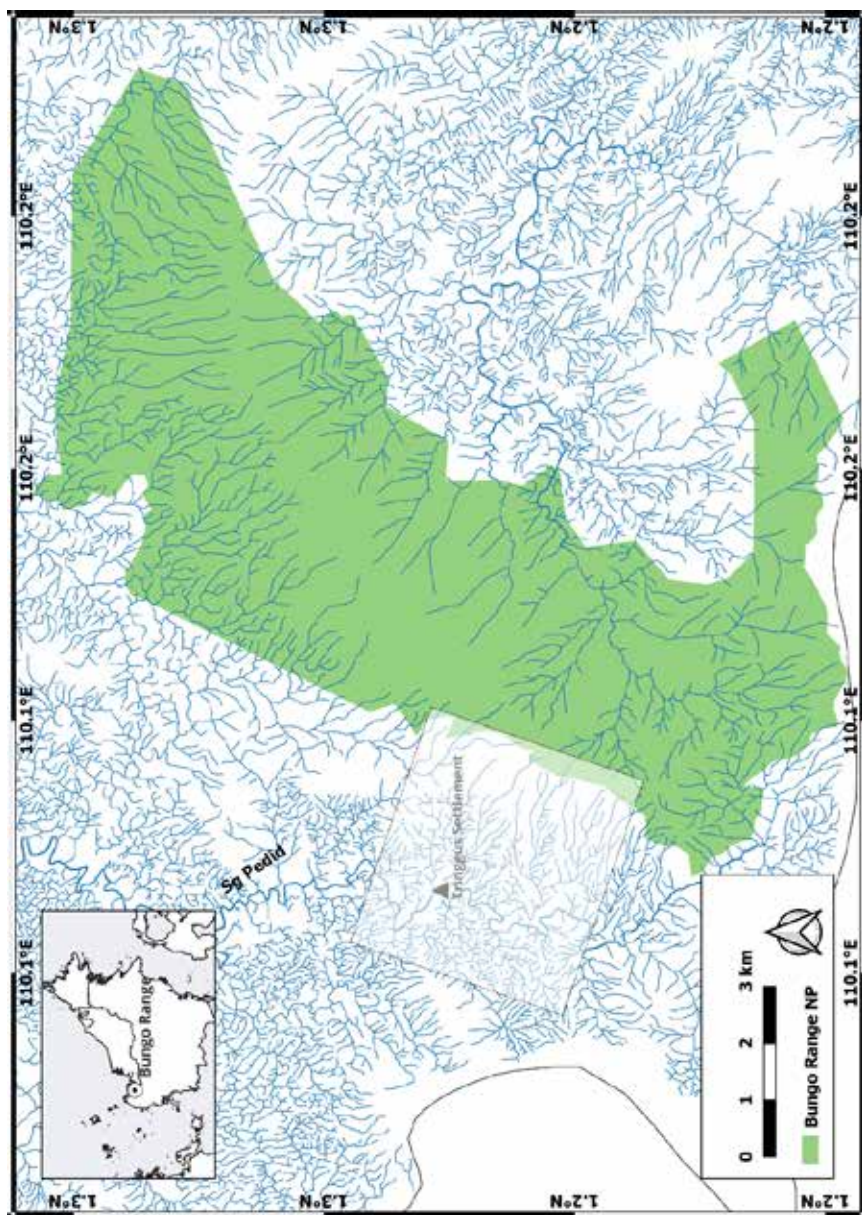
Bungo Range is located at 10° 16' latitude and 110° 9' longitude of the southern side of the HOB, about 500 meter above the sea level. The mountainous primary forest of the area was gazetted as Bungo Range National Park on 26<sup>th</sup> February 2009 covering 8,096 heactares (**Figure 1.1**). Bungo Range is an important water catchment area in the upstream of the Sarawak Kiri River and Sarawak Kanan River, where the Bengoh Dam is built to provide water supply for Kuching population. The southern end of the Bungo Range is the boundary of West Kalimantan, Indonesia.

In 2017, a multidisciplinary expedition to Bungo Range was conducted as one of the activities organized in conjunction with UNIMAS's Silver Jubilee Celebration. The Institute of Biodiversity and Environmental Conservation had led the expedition with the support of Forest Department Sarawak and other Institutes as well as Faculties within the university. The goal of the expedition was to increase the visibility of UNIMAS not just to the Tringgus community, but also to answer the call of the Sarawak government that wants to emphasise the implementation of Digital Biodiversity

in this state. The expedition was conducted for two weeks with the launching of the event held on 5<sup>th</sup> December 2017 at Tringgus settlement area.

Despite the earliest exploration in the area back to year 1880s, there is a lack of information pertaining to biodiversity and socio-economy, which are necessary to enhance biodiversity conservation, and boost local economic activities in the area. The expedition had produced substantial baseline data for the management of Bungo Range National Park, and highlight the area as a tourism destination, which eventually would benefit the local community in the area. The findings of the expedition are compiled herewith, comprising historical exploration in Bungo Range, water resource, aquatic biodiversity, floristics, mammals, birds, reptiles, amphibians, insects, and health and socio-economics of the locals. In summary, this book reported a total of 313 species of plants mainly orchids and zingers, and 298 species of wildlife among others are 105 birds, 39 mammals, 92 insects, 27 reptiles, 17 amphibians, and 59 aquatic lives. Additionally, the use of natural resources by local community in Tringgus is also presented in this book.

Because the expedition had only covered a small area of the southern section of the Bungo Range, gaps of information in this edition are expected, which suggest more explorations are needed in the near future. In this regard, the editors would like to acknowledge the contribution of the authors of each article in this edition. This edition may not stop here, and we wish to be working with you all again!



**Figure 1.1.** Map of Bungo Range National Park and the expedition area (shaded box).







**THEME:**  
**GEOLOGICAL STUDY  
AND ZOOLOGICAL  
EXPLORATION**

# UNDERSTOREY FLORA OF SOUTHWESTERN BUNGO RANGE

Meekiong Kalu, Mohd Effendi Wasli, Hafsah Nahrawi and  
Zinnirah Shabdin

Bungo Range National Park is located in Kuching division, shared by two small districts, Bau and Padawan. It is about 67 km journey by road from Kuching City and, about 23 km away from the small town of Bau. The park is gazetted in the year 2009 (Swk, L.N.10) as the 22<sup>nd</sup> national park under the National Park and Nature Reserve Ordinance, 1990 of Sarawak. The park is the largest national park in Kuching division with the coverage area of 8,096 ha. The landscape of Bungo Range National Park consists of hilly terrain with elevation ranging from 300 to 950 meters above sea level. Among the unique physical features of Bungo Range National Park is the crescent-like shaped of the range. Furthermore, the upper part of the range consisted of sandstone which is bedded on the limestone rock. Perhaps, these unique geological features of Bungo Range promote diverse richness in microhabitats.

The neighbouring national park, Dered Krian National Park (Bau limestone) just a few kilometres away on the western part, has been among the most prevalent sites among many botanists and plant collectors since the first excursion made by Hugh Low in 1849. Unlike Dered Krian, there are no records or studies documented on the floristic composition in this area. The understorey flora surveys were conducted during the scientific expedition for Tringgus Bong (south-west part) and the following month for the northern part (*via* Bengoh Dam Resettlement Area). The coverage surveyed areas, however, only represented about 15% of the total park areas.

A provisional documentation displays that Bungo Range National Park is extremely rich with understorey flora. A total of 313 species in 72 genera and 32 families of flowering plants were recorded during the surveys. The most speciose families are Orchidaceae (78 species), Zingiberaceae (39 species), Rubiaceae (35 species), Araceae (28 species) and more than 20 species each for Gesneriaceae, Moraceae and Arecaceae, respectively. At the generic level, the most diverse genus is the *Bulbophyllum* with 15 species, followed by *Dendrobium* and *Mapania* with 12 species each, and *Piper*, *Zingiber* and *Timonius* with 10, 8 and 8, respectively. The most notable genera, which frequently cannot be identified owing to lack of information, are *Elatostema*, *Piper* and Gesneriads.

Gingers are probably the most common terrestrial understorey plants encountered within Bungo Range National Park. Most of this species can be found at damp and wet places along the water sources or, in between the gullies and rock boulders. The short-stemmed gingers such as *Boesenbergia*, *Borneocola*, *Camptandra* and *Haplochorema* (now being proposed to be placed in the *Boesenbergia*) are commonly spotted in the rocky kerangas forest at the southern part of the park. *Boesenbergia pulchella* or locally known as *Jerangau merah* is the most common *Boesenbergia* species that can be found throughout Sarawak including at Bungo Range National Park. *Camptandra gracillima* is endemic to Borneo, found as lithophyte on the rock surfaces. A new ginger species was also discovered during the expedition. *Sundamomum bungoensis* (Aimi Syazana & Meekiong) Salasiah & Meekiong [previously under the genus *Amomum*] was described and named after the type locality.



**Plate 7.1.** *Boesenbergia pulchella*



**Plate 7.2.** *Camptandra gracillima*



**Plate 7.3.** *Haplochorema* sp.



**Plate 7.4.** *Mapania caudata*



**Plate 7.5.** *Mapania cuspidata*



**Plate 7.6** *Polygala venenosa*

A member of sedges family, the genus *Mapania* was frequently found along the trails, particularly in the shaded areas near to the water sources. *Mapania cuspidata* or vernacularly known as *Rumput serapat* by the Malay people, was found in abundance and sometimes grew sympatrically with three other *Mapania* species (*Mapania caudata*, *Mapania palustris* and *Mapania wallichii*). *Mapania cuspidata* var. *angustifolia*, which previously was recorded only from Bako National Park, also recorded from the northern

part of the Bungo Range National Park and is considered as a new geographical record. Two interesting unidentified taxa are possibly new species but are still under further investigations for confirmation.

Several protected plant species from the genus *Aeschynanthus*, *Begonia*, *Cyrtandra*, *Hexatheca* and *Johannesteijmannia* were also recorded within and outside the park. All the species, except *Johannesteijmannia altifrons* or *Palma ekor buaya* are considered as not threatened and found in large populations within the park. *Palma ekor buaya* however, was recorded in kerangas forests outside the park with only few individuals in two populations.

Other common plants recorded along the trails include *Dracaena congesta*, *Hanguana malayana*, *Hellenia globosa*, *Homalomena cf. humilis*, *Impatiens platypetala*, *Molineria latifolia*, *Piper vestitum*, *Polygala venenosa*, *Poikilospermum* sp., *Stachyphrynium* sp. and *Zingiber acuminatum* var. *borneense*.



**Plate 7.7.** *Begonia lailana*



**Plate 7.8.** *Homalomena cf. humilis*

Besides the flowering plants, non-flowering plants, ferns and fern-allies as well as bryophytes are also exceptionally rich in the lower strata of the forest at Bungo Range National Park. At least, more than 15 families of ferns and fern-allies and 10 families of bryophytes were recorded within the park. The family Polypodiaceae with 12 species and Selaginellaceae with seven species represented the most specious family for ferns and fern-allies respectively. While the family Calymperaceae with 10 species represented the bryophytes.

The provisional documentation showed a tremendous number of understorey flora recorded within the Bungo Range National Park based, on approximately 15% of the total surveyed area. With the remaining vast areas yet to be surveyed and explored, it is estimated that the number of understorey flora in the Bungo Range National Park might exceed 700 species.



**Plate 7.9.** *Johannesteijmannia altifrons*



**Plate 7.10.** *Piper vestitum*

# BUNGO RANGE

**BIODIVERSITY AND COMMUNITY**

This book highlights the significant findings from the Multidisciplinary Expedition in Bungo Range conducted on 5-10 December 2017. The expedition was organized by the Institute of Biodiversity and Environmental Conservation, UNIMAS with support from the Forest Department Sarawak. This volume is illustrated in 24 chapters covering the historical exploration of Bungo Range, a geological feature of the mountain, water resources, aquatic biodiversity, floristics, mammals, birds, reptiles, amphibians, insects, and health and socio-economics of the Tringgus community. It is reported herewith in the book that there are a total of 313 species of plants mainly orchids and zingers, and 298 species of wildlife, among them 105 birds, 39 mammals, 92 insects, 27 reptiles, 17 amphibians, and 59 aquatic lives. Additionally, the use of natural resources by the local community in Tringgus is also presented. This book can serve as a useful reference for the development and management of Bungo Range National Park, and the communities living surrounding the area.