Seminar

EKSPEDISI SAINTIFIK

KEPELBAGAIAN BIOLOGI HUTAN MOSSY FOREST

CAMERON HIGHLANDS, PAHANG

Mossy Forest
Taman Dalam Awan

7 - 8 MAC 2024 (KHAMIS - JUMAAT)

ZENITH HOTEL CAMERON HIGHLANDS

TENTATIF PROGRAM

MAJLIS PERASMIAN SEMINAR

Hari Pertama 7 Mac 2024 (Khamis)

8.30 pagi	**Pendaftaran Seminar**
8.45 pagi	**Ketibaan Dif-dif Jemputan**
8.55 pagi	**Ketibaan YBhg. Dato' Indera Ketua Pengarah Perhutanan Semenanjung Malaysia**
9.00 pagi	**Ketibaan Yang Berhormat Setiausaha Kerajaan Pahang** **Nyanyian lagu:** **Negaraku** **"Allah Selamatkan Sultan Kami"** **Warisan Hijau** **Bacaan Doa** **Ucapan Alu-aluan:** **YBrs. Pengarah Perhutanan Negeri Pahang** **Ucapan Perasmian:** **Yang Berhormat Setiausaha Kerajaan Pahang** **Pelancaran Seminar Ekspedisi Saintifik Kepelbagaian Biologi Hutan, Mossy Forest, Cameron Highlands, Pahang** **Pelancaran Buku Coffee Table Raflesia** **Ucaptama oleh YBhg. Dato' Indera Ketua Pengarah Perhutanan Semenanjung Malaysia** **Sesi Fotografi** **Lawatan ke Ruangan Pameran** **Jamuan Pagi** **Sidang Media**

SESI PEMBENTANGAN 1

Pengerusi Sesi: Tuan Haji Mohd Ridzuwan bin Endot (Pengarah Bahagian Silvikultur Dan Pemeliharaan Biologi Hutan, Ibu Pejabat Perhutanan Semenanjung Malaysia)

10.15 pagi	**Kertas Kerja 1** *Strategi Jabatan Perhutanan Negeri Pahang Bagi Pengiktirafan Mossy Forest, Cameron Highlands Sebagai Man and Biosphere Negeri Pahang* **Pn. Nurfazliza binti Kamarulbahrin** *Penolong Pengarah Kanan (Silvikultur) Pahang Timur Jabatan Perhutanan Negeri Pahang*
10.35 pagi	**Kertas Kerja 2** *Taman Ekorimba Mossy Forest, Cameron Highlands: Peranan Dalam Pendidikan, Penyelidikan dan Ekopelancongan* **Latiff, A.**
10.55 pagi	**Kertas Kerja 3** *The distribution of rock types in Mossy Forest, Cameron Highland, Pahang* **Elvaene James, Hamzah Hussin & Muhamad Anas Aziz**
11.15 pagi	**Kertas Kerja 4** *Landslide Geohazard Assessment at Cameron Highland Using Remote Sensing & GIS Techniques* **Hamzah Hussin, UMK**
11.35 pagi	**Kertas Kerja 5** *Struktur Dan Kepelbagaian Vegetasi Lantai Hutan Mossf Forest, Cameron Highlands, Pahang* **Nor 'Aqilah, M. B., Z. Ahmad Fitri, Mohammad Khairul Faizi Zulkifli, M. S. Nizam**
11.55 pagi	**Sesi Soal Jawab**
12.15 tgh hari	**Penyampaian Cenderamata Kepada Pembentang Kertas Kerja dan Pengerusi Sesi** **Sesi Fotografi**
12.25 tgh hari	**Jamuan Tengah Hari** **Rehat**

SESI PEMBENTANGAN 2

Pengerusi Sesi: En Nor Zaidi bin Jusoh
(Timbalan Pengarah Pembangunan,
Jabatan Perhutanan Negeri Pahang)

2.00 petang	**Kertas Kerja 6** *A New Liverwort Species From Mossy Forest, Cameron Highlands, Pahang, Peninsular Malaysia* **Lee, G. E., E. Pesiu & X. L. He**
2.20 petang	**Kertas Kerja 7** *Epiphyllous Liverworts of Mt. Brinchang and Mt. Irau, Cameron Highlands, Pahang, Peninsular Malaysia* **Pesiu, E., Saidatul Atiqah & G. E. Lee**
2.40 petang	**Kertas Kerja 8** *Investigating The Effect of Solenostoma sp. Methanolic Extract On Mcf-7 Nreast Cancer Cell Growth* **Maziah M. Ghazaly, G. E Lee & Noor Fatin Shabira**
3.00 petang	**Kertas Kerja 9** *Moss Diversity of Mossy Forest, Cameron Highlands, Pahang, With Notes on Some Other Bryophytes* **Nik Norhazrina, K. T. Yong, Q. J. Leong, Nur Syazwana, S. Venkrachalam, Mohammad Akman, G. E. Lee & Haja Maideen.**
3.20 petang	**Sesi Soal Jawab**
3.40 petang	**Penyampaian Cenderamata Kepada Pembentang Kertas Kerja dan Pengerusi Sesi** **Sesi Fotografi**
3.50 petang	**Jamuan Petang**

SESI PEMBENTANGAN 3

Pengerusi Sesi: Encik Mohd Radhi Chu bin Abdullah
(Pengarah Bahagian Ladang Hutan Dan Perlindungan Hutan,
Ibu Pejabat Perhutanan Semenanjung Malaysia)

4.05 petang	**Kertas Kerja 10** *Flora Paku Pakis Di Taman Ekorimba Mossy Forest, Cameron Highlands, Pahang* **Nurul Nadirah, Maideen, H., Nik Muhamad Haikal, Nur Aliah, Nik Norhazrina & Azi Azeyanti**
4.25 petang	**Kertas Kerja 11** *Kepelbagaian Dan Komposisi Rotan (Arecaceae : Calamoideae)* **Asyraf Mansor, Rahmad Zakaria, Rosnezam & Nur Diana Mohd. Rusdi**
4.45 petang	**Kertas Kerja 12** *Suatu Senarai Awal Tumbuhan Berbunga di Taman Ekorimba Mossy Forest, Hutan Simpan Batu Gangan, Cameron Highlands, Pahang* **Ahmad Fitri, Z., Nur 'Aqilah, M.B., Mohammad Khairul Faizi, Z., Nik Hazlan, N.H., Nik Norafida, N.A., Nizam, M.S., Wan Norilani, W.I., Norazlinda, Ahmad Firdaus, Z., M., Engku Azlin Rahayu Engku Ariff, Noraini, T. & Latiff, A.**
5.05 petang	**Kertas Kerja 13** *A checklist of Araceae With Special Emphasis on Arisaema filiforme and A. brinchangense in Mossy Forest, Cameron Highlands, Pahang* **Norhazlini, M. Z., Asraf Fizree, M. & Zulhazman, H.**
5.25 petang	**Kertas Kerja 14** *Diversity of Ginger (Zingiberaceae) of Mossy Forest, Cameron Highlands, Pahang* **Suganthi, A. & Niivarani**
5.45 petang	**Sesi Soal Jawab**
6.05 petang	**Penyampaian Cenderamata Kepada Pembentang Kertas Kerja dan Pengerusi Sesi** **Sesi Fotografi**
6.15petang	**Rehat**
7.00 petang	**Makan Malam (Bagi Yang Menginap Di Hotel)**

Hari Kedua 8 Mac 2024 (Jumaat)

8.00 pagi **Pendaftaran**

SESI PEMBENTANGAN 4

Encik Nor Azirim bin Ahmad
(Ketua Penolong Pengarah Penguatkuasaan,
Jabatan Perhutanan Negeri Pahang)

8.30 pagi **Kertas Kerja 15** Pepanjat Di Hutan Mossy Forest, Cameron Highlands, Pahang

Rahmad Zakaria, Asyraf Mansor, Mohd. Abdul Muin Md. Akil & Rosnezam Mohamad

8.50 pagi **Kertas Kerja 16** An Update on Orchids of Mossy Forests EcoPark, Cameron Highlands, Pahang

Qistina Anis Mad Jabar, Edward E. Besi, Debbie Sandin Muhamad Ikhwanuddin Mat Esa, S. H. Tan, & Rusea Go

9.10 pagi **Kertas Kerja 17** Liken di Mossy Forest, Gunung Brinchang dan Tanah Rata, Cameron Highlands, Pahang

Laily B. Din & A. Latiff

9.30 pagi **Kertas Kerja 18** Wild Flowers Taman Ekorimba Mossy Forest, Cameron Highlands, Pahang

Tan, S. H., Edward E. Besi, Debbie Sandin Muhamad Ikhwanuddin Mat Esa, Qistina Anis Mad Jabar, Mohd. Norfaizal Ghazali & Rusea Go

9.50 pagi **Kertas Kerja 19** Kajian Perbandingan Vegetasi Di Kawasan Luang Dan Terganggu Di Hutan Pergunungan Atas Di Beberapa Denai Terpilih Taman Ekorimba Mossy Forest, Cameron Highlands, Pahang

Rosni Ludin, Kamarulizwan Kamarudin, Siti Zurina Zakaria & M. Nazre

10.10 pagi **Sesi Soal Jawab**

10.30 pagi **Penyampaian Cenderamata Kepada Pembentang Kertas Kerja dan Pengerusi Sesi**

Sesi Fotografi

10.40 pagi **Minum Pagi**

SESI PEMBENTANGAN 5

Pengerusi Sesi: Encik Harry Yong,
(Pengarah Bahagian Hal Ehwal Antarabangsa,
Ibu Pejabat Perhutanan Semenanjung Malaysia)

10.55 pagi **Kertas Kerja 20** Plecoptera Composition of Mossy Forest Streams, Cameron Highlands, Pahang

Nor Asyikin Mohd. Fauzi, UMK

11.15 pagi **Kertas Kerja 21** Kepelbagaian Serangga Odonata Di Hutan Mossy Forest, Cameron Highlands, Pahang

Choong, C. Y.

11.35 pagi **Kertas Kerja 22** Thysanoptera (Thrips) Fauna of Mossy Forest, Cameron Highlands, Pahang

Ng, Y. F.

11.55 pagi **Kertas Kerja 23** Diversity of Herpetofauna At Mossy Forest, Cameron Highlands, Pahang

Muhamad F. Syafiq, Baizul Hafsyam Badli-Sham, Mohamad Aqmal-Naser, M. K. Ariff & Amiruddin Ahmad

12.15 tgh hari **Kertas Kerja 24** Spesies Burung Di Hutan Mossy Forest, Cameron Highlands, Pahang

Puan, C. L., Al-Kautsar Hidayanto Abdul Rahim, Amera Natasha Mah Muhammad Adam Mah & Mohd. Abdul Muin Md. Akil

12.35 tgh hari **Kertas Kerja 25** Notes On Mammals Recorded At Mossy Forest, Cameron Highlands, Pahang

Yazid,H., V.K.Jayaraj, M. A. Khaidhir, L.J.Young & P.H.Fong

12.55 tgh hari **Sesi Soal Jawab**

1.15 tgh hari **Penyampaian Cenderamata Kepada Pembentang Kertas Kerja dan Pengerusi Sesi**

Sesi Fotografi

1.25 tgh hari **Jamuan Tengah Hari**
Rehat
Solat Jumaat

SESI PEMBENTANGAN 6

Pengerusi Sesi: Tuan Haji Md Zaidey bin Abdul Kadir
(Ketua Penolong Pengarah Pengurusan Hutan,
Jabatan Perhutanan Negeri Pahang

2.30 petang	**Kertas Kerja 26** Study On The Potential of Risk Assessment In Mossy Forest, Cameron Highlands, Pahang **Nik Jaswiri Johannis, Nor Hanisah Hashim, Abdul Rauf Abdul Rasam, M. Adli Mohd. Sidi & Mohd. Shariman Shafie**
2.50 petang	**Kertas Kerja 27** Ecotourism Mapping At Mossy Forest, Cameron Highlands, Pahang : Potential Features And Functions of The Map Design And Development **Abdul Rauf Abdul Rasam, Nor Hanisah Hashim, Nik Jaswiri Johannis, M. Adli Mohd. Sidi & Mohd. Shariman Shafie**
3.10 petang	**Kertas Kerja 28** A Travel Cost Analysis of The Value of Nature Tourism of Taman Ekorimba Mossy Forest, Cameron Highlands, Pahang **Nor Hanisah Hashim, Abdul Rauf Abdul Rasam, Nik Jaswiri Johannis, M. Adli Mohd. Sidi & Mohd. Shariman Shafie**
3.20 petang	**Sesi Soal Jawab**
3.40 petang	**Penyampaian Cenderamata Kepada Pembentang Kertas Kerja dan Pengerusi Sesi** **Sesi Fotografi**
3.50 petang	**Jamuan Petang**
4.15 petang	**Majlis Penutup** **Rumusan oleh Ketua Ekspedisi** **Ucapan Penutup oleh** **YBrs. Pengarah Perhutanan Negeri Pahang**
5.00 petang	**Bersurai**

01

Nurfazliza, K.,
Roslan, R., Nor Zaidi J.,
Arifhadi, J.A

Jabatan Perhutanan Negeri Pahang

Strategi Jabatan Perhutanan Negeri Pahang Bagi Pencalonan Mossy Forest Sebagai Tapak Rizab Biosfera (Man and Biosphere Programme) UNESCO

ABSTRAK:

Kerajaan Negeri telah meluluskan penubuhan "Man and Biosphere (MAB) Mossy Forest" pada Majlis Mesyuarat Kerajaan (MMK) Pahang pertama pada 3 Januari 2024. Keputusan ini adalah berlandaskan nilai estetika persekitarannya, nilai biodiversiti dan potensi ekopelancongan yang terdapat di kawasan ini.

Penubuhan "Man and Biosphere Mossy Forest" melibatkan 13 Hutan Simpanan Kekal (HSK) seluas ±4,963.57 hektar (±12,264.98 ekar) dan sebahagian Tanah Kerajaan serta Tanah Milik seluas ±3,398.93 hektar (±8,398.76 ekar) di Mukim Ulu Telom dan Mukim Tanah Rata, Daerah Cameron Highlands. Usaha ini adalah selaras dengan dokumen Blueprint Pahang Destinasi Warisan Dunia: Transformasi ke Arah Ekonomi Berasas Khazanah. Dokumen ini menggariskan hasrat pelaksanaan pembangunan sumber berasaskan pengiktirafan tapak/kawasan sebagai warisan sejagat [Tapak Warisan Dunia (World Heritage Site), Man and Biosphere Reserve (MAB) dan UNESCO Global Geopark (UGGp)] serta strategi pembangunan geotapak, biotapak dan tapak sejarah/arkeologi melalui pelancongan ilmu (ekopelancongan, geopelancongan dan pelancongan budaya).

Penubuhan MAB Mossy Forest Cameron Highlands adalah untuk memulihara kepelbagaian biologi mempromosikan pembangunan lestari. Dalam hal ini, MAB ini berfungsi sebagai model untuk penggabungan pemuliharaan dan pembangunan, dan menyediakan rangka kerja kepada komuniti tempatan bagi mengembangkan dan melaksanakan strategi pembangunan ekonomi dalam masa yang sama sumber semula jadi dilindungi. Dalam pada masa yang sama, MAB Mossy Forest juga memainkan peranan yang signifikan dalam aktiviti penyelidikan dan pendidikan.

Melalui penubuhan MAB ini, Kerajaan Negeri Pahang akan dapat meningkatkan pemahaman orang awam tentang kepentingan pemeliharaan ekologi dan pengurusan sumber secara lestari. Pengetahuan ini kemudiannya akan digunakan untuk membangun dan melaksanakan strategi pemuliharaan dan pengurusan yang memberi faedah kepada secara holistik manusia dan alam sekitar.

***Kata kunci*: Man and Biosphere, Mossy Forest, UNESCO**

02

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Mossy Forest, Cameron Highlands, Pahang : Peranan Dan Potensi Dalam Pendidikan, Penyelidikan, Pemuliharaan Kepelbagaian Biologi Dan Ekopelancongan

ABSTRAK:

Di Semenanjung Malaysia hutan lumut terdapat pada ketinggian 1,000 m a.p.l. dan lebih. Justeru itu ia terdapat di Banjaran Titiwangsa dan Gunung Tahan. Antara yang sudah terkenal ialah di Gunung Berinchang, Cameron Highlands, Pahang. Hutan lumut terkenal dengan kekayaan kepelbagaian biologi lumut jati, lumut hati dan lumut tanduk. Hutan lumut Mossy Forest di Gunung Berincang telah lama dikunjungi oleh pendaki gunung dan pengunjung bagi tujuan rekreasi. Aset ini jikalau diurus secara lestari dan baik mampu memainkan peranan yang lebih penting dalam pendidikan ekologi gunung penyelidikan bagi para penyelidik dari universiti dan institut penyelidikan tempatan dalam memahami flora, fauna dan kedinamikan ekologi hutan lumut. Ia juga mampu memainkan peranan dalam pemuliharaan kepelbagaian biologi dan mempunyai potensi yang tinggi sebagai tarikan rekreasi tempatan dan pelancongan ekologi di kedua-dua peringkat kebangsaan dan negeri, justeru mampu meningkatkan sektor pelancongan dalaman di Pahang dan Malaysia amnya. Fungsi Hutan Mossy Forest, Cameron Highlands dan aset alamiah lain akan dibincangkan bersama potensi untuk pendidikan, penyelidikan dan pelancongan ekologi di Pahang dan Malaysia.

03

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The Distribution Of Rock Types In Mossy Forest Cameron Highlands, Pahang

ABSTRACT :

The Mossy Forest is located in the Main Range of Triassic granite as part of the mountainous landscape in Cameron Highlands, Pahang. The predominant rock in the study area is granite, specifically biotite granite porphyry, with a minor intrusion of quartz ridge. Biotite granite porphyry can be characterized as medium to coarse grain-size, greyish colour, alkali feldspar acts as a phenocryst with groundmass of quartz, alkali feldspar, plagioclase, biotite, muscovite, and hornblende minerals. The exposure of the biotite granite porphyry is limited since it is mainly covered with moss and vegetation on top of he mountain. As for the quartz ridge, the coverage is small, around 30-meter areas. The quartz is milky white and shows many fractures in the rocks. Most of the rocks are highly weathered, and the bedrock can be found as deep as 4 meters deep in the cutting lope road.

Key words: **Biotite Granite Porphyry, Quartz Ridge, Cameron Highlands, Mossy Forest**

04

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Landslide Geohazard Assessment At Cameron Highlands Using Remote Sensing And GIS Techniques

ABSTRACT :

The occurrence of landslide hazard events on steep slopes, particularly in hilly and mountainous terrains like the Cameron Highlands is a significant concern. However, the challenging factors of extensive vegetation obstructing landslide visibility and the region's rainy weather conditions in Malaysia further complicate the mapping of landslides. In this study the landslide assessment was conducted using AHP method. A total of 13 parameter being used in the analysis. These parameters are slope gradient, curvature, soil type, lithology, elevation, lineament density, slope aspect, normalised difference vegetation index, rainfall, land use land cover, proximity to road, drainage density and proximity to fault. The findings shown 0.79% of Cameron HighlandS is classify as very low, 4.37% as low, 12.02% as moderate, 45.51% high and 40.30% as very high.

Key words: **Landslide, AHP, Cameron Highlands**

05

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Struktur dan Kepelbagaian Vegetasi Lantai Hutan *Mossy Forest* Cameron Highlands, Pahang

Structure And Diversity Of Forest Floor In Mossy Forest, Cameron Highlands, Pahang

ABSTRAK:

Memahami akan struktur vegetasi lantai hutan adalah penting kerana peranannya dalam memastikan proses penyelenggaraan hutan berlaku secara berterusan. Vegetasi lantai hutan ini akan tumbuh dan akhirnya menjadi struktur dirian pokok dalam hutan klimaks. Oleh itu, kajian ini adalah untuk i) menentukan komposisi dan kepelbagaian spesies anak pokok yang berdiameter 1 cm hingga 4.9 cm DBH di Hutan *Mossy Forest,* Cameron HighlandS ii) mengenalpasti tahap endemik dan status pemuliharaan spesies pokok hutan di Hutan Mossy Forest, Cameron HighlandS. Bagi tujuan itu, empat plot berkeluasan 2 m × 2 m setiap satu telah dibina (0.0016 ha) dan kesemua pokok dalam plot kajian yang berdiameter pada paras dada (DBH) 1 cm hingga 4.9 cm diukur, ditanda, dicam dan direkodkan. Hasil kajian mencatatkan sebanyak 430 individu pokok yang terdiri daripada 20 famili, 27 genus dan 30 spesies yang mana Melastomaceae merupakan famili terbesar. *Sonerila* dan *Sonerila* rudis daripada famili Melastomaceae masing-masing merekodkan sebagai genus dan spesies terbesar dalam plot kajian dengan jumlah 106 individu. Jumlah kepadatan keseluruhan yang dilaporkan adalah 268, 750 individu/ha, yang mana Melastomataceae (79375 individu/ha) penyumbang kepadatan tertinggi dan tiga famili yang mempunyai kepadatan terendah (Myrsinaceae, Palmae, Thymelaeaceae). Hasil kajian mendapati nilai Indeks Kepelbagaian \Shannon (H') adalah 2.015, Indeks Keseragaman Shannon (E) adalah 0.375 dan Indeks Kekayaan Margalef (R) adalah 3.133. Terdapat 12 spesies endemik dilaporkan dan kebanyakan spesies yang endemik ini tergolong dalam famili Melastomataceae.

***Kata kunci*: bawah kanopi, kepadatan, Indeks Kepelbagaian, Status, Mossy Forest**

06

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A new Liverwort species from Cameron Highlands, Peninsular Malaysia

ABSTRACT :

A new species of liverwort discovered in Peninsular Malaysia is described and llustrated as a new addition to the genus *Mastigopelma* Mitt., of the family Lepidoziaceae. The new species is corticous, growing on a tree branch in a moist montane forest in Cameron Highlands, Pahang, at 1900 m alt. It is characterized by the leafy shoots arising from stolons, branches, when present, all ventral-intercalary, and terminal branching lacking; asymmetrical leaves with almost straight ventral margins, rounded to truncate leaf apices, entire-margined leaves, thickened cell walls with nodular trigones, and listening-homogeneous oil bodies (2-4 per cell); and retuse to blunt teethed underleaf pices. This discovery has increased the total number of known species of Mastigopelma Mitt. to five.

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Epiphyllous Liverwort (Marchantiophyta) Flora of Mount Irau, Cameron Highlands, Pahang

ABSTRACT :

A study on epiphyllous liverworts was conducted in Mount Irau, Cameron Highlands, Pahang during the Mossy Forest Scientific Expedition from 10th-14th March 2023. This study aims to provide a preliminary checklist of epiphyllous liverworts in Mount Irau. All the epiphyllous liverwort specimens were collected from the surveyed trails. A total of 62 species of epiphyllous liverworts in 20 genera and 6 families was discovered. The largest family was Lejeuneaceae with 15 genera and 52 species. The largest genus is represented by *Cololejeunea* with 16 species, followed by *Drepanolejeunea* with 7 species. More studies, especially in unexplored areas of Cameron Highlands, need to be covered in the future to fill the gap in knowledge on the species distribution of this interesting group of bryophytes.

08

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Investigating the Effect of *Solenostoma* sp. Methanolic Extract on Mcf-7 breast Cancer Cell Growth

ABSTRACT :

Breast cancer, the leading malignancy among women globally, necessitates innovative therapeutic strategies due to rising incidence rates. Research indicates that bryophyte compounds inhibit cancer cell proliferation, yet their specific anti-proliferative effects remain unexplored. A recent study investigated Solenostoma sp. extract's impact on MCF-7 breast cancer cells. Cells were exposed to varying concentrations (7.8, 15.6, 31.3, 62.5, 125, and 250 μg/mL) of the extract for up to 24 hours. Results revealed dose-dependent cytotoxicity, increased Reactive Oxygen Species (ROS) levels, cell cycle arrest, and late apoptosis induction at higher concentrations (125-250 μg/mL). Consequently, Solenostoma sp. extract effectively suppressed MCF-7 breast cancer cell proliferation. However, further research is warranted to elucidate its effects on DNA damage response and downstream signaling pathways. This promising finding suggests the potential for developing alternative, less side-effect-prone treatments for various cancer-related conditions.

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The Moss Diversity of The Mossy Forest, Cameron Highlands, Pahang, With Notes on Some Other Bryophytes

ABSTRACT :

Mossy Forest, Cameron Highlands, Pahang harbours 95 species, 2 subspecies and 15 varieties in 51 genera and 24 families of mosses. This diversity constitutes 19.5% of the 564 taxa, 32.1% of the 159 genera, and 51.1% of the 47 families of mosses reported for Peninsular Malaysia. Moreover, it also represents 24.6% of 455 taxa, 38.1% of 134 genera and 60.0% of 40 families of mosses recorded in Pahang. Among the 112 taxa listed, three species and one variety are reported new to Peninsular Malaysia. viz. *Brotherella falcata* (Dozy & Molk.) M. Fleisch., *Orthomnium elimbatum* (Nog.) T.J. Kop., *Warburgiella leptorhynchoides* (Mitt.) M. Fleisch. and *Warburgiella leptocarpa* (Schwägr.) M. Fleisch. var. *cylindrica* (A. Jaeger) B.C. Tan, T.J. Kop. & D.H. Norris. Sematophyllaceae with 23 taxa is the most represented family, followed by Pylaisiadelphaceae with 14 taxa and Leucobryaceae with 12 taxa. While, the smallest families are all represented by a single species namely, Bryaceae, Hypnodendraceae, Hypopterygiaceae, Myuriaceae, Neckeraceae, Orthodontiaceae, Orthotrichaceae, Plagiotheciaceae dan Pottiaceae. The three most prominent genera that are very diverse in the study area are *Acroporium, Distichophyllum* and *Leucobryum*. In addition, four liverworts and a hornwort species are also reported in this study.

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Flora Paku Pakis dan Kerabatnya di Taman Eko-Rimba Mossy Forest, Cameron Highlands, Pahang

ABSTRAK:

Sejumlah 21 famili, 42 genus dan 62 takson telah dianggarkan daripada pemerhatian awal yang dibuat di Taman Eko-Rimba Mossy Forest, Cameron Highlands, Pahang. Ia terdiri daripada 5 takson Lycophyta dalam tiga genus *(Huperzia, Lycopodium dan Selaginella)* dan 58 takson bagi Monilophyta. Famili Polypodiaceae adalah famili terbesar yang direkodkan yang terdiri daripada 13 takson. Jumlah ini keseluruhan takson daripada catatan awal ini merangkumi 10% daripada 647 spesies yang telah dilaporkan di Semenanjung Malaysia.

Kata kunci: **Hutan berlumut, Monilophyta, Lycophyta, Paku pakis**

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Kajian Kepelbagaian dan Komposisi Rotan (Arecaceae : Calamoideae) di Mossy Forest, Cameron Highlands

ABSTRAK:

Suatu tinjauan kepelbagaian spesies rotan telah dilakukan di denai utama kawasan eko-pelancongan Mossy Forest, Cameron Highlands, Pahang pada 11 – 14 Mac 2023. Objektif utama tinjauan ini dilakukan adalah bagi mengumpulkan maklumat terkini berkaitan komposisi dan taburan spesies rotan (Arecaceae) di kawasan tersebut. Secara umum, keseluruhan kawasan Mossy Forest dibahagikan kepada dua ketinggian utama, i) kawasan ketinggian 1500-2000 m dari aras laut, dan ii) kawasan dengan ketinggian melebihi 2000 m dari aras laut. Tinjauan dilaksana menggunakan kaedah "belt-transect" sepanjang 1500 m di denai dan laluan hutan, yang mana penyelidik terlibat membuat cerapan spesies di 10 m kiri dan kanan transek berkenaan. Hasil tinjauan menemukan hanya tiga spesies rotan di kawasan yang dikaji iaitu, *Calamus simplex, C. exilis,* dan *C. rugosus.* Kesemua spesies ini direkodkan di kawasan ketinggian tidak melebihi 2000 m tinggi dari aras laut. Daripada segi kepadatan individu, C. simplex adalah spesies rotan paling lazim ditemukan. Hasil dapatan ini adalah suatu yang dijangka dan bertepatan dengan kajian terdahulu berkenaan sebaran dan taburan populasi rotan yang lazimnya lebih bertumpu di kawasan lembab tanah rendah dan berpaya. Walaupun spesies rotan yang ditemukan tidak mempunya nilai ekonomi yang tinggi, terutamanya bagi tujuan pembuatan perabot dan lain lain perkakasan hiasan, namun kepentingan spesies ini daripada segi suatu khidmat ekosistem sebagai sumber makanan dan habitat fauna yang lain perlu diambil berat. Pemeliharaan ekosistem sedia ada amat penting bagi memastikan populasi spesies rotan ini dapat dijaga.

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Suatu Senarai Awal Tumbuhan Berbunga di Taman Eko Rimba Mossy Forest, Hutan Simpan Batu Gangan, Cameron Highlands, Pahang

ABSTRAK:

Flora tumbuhan berbunga di hutan pergunungan atas yang boleh ditemui pada ketinggian melebihi 1,500 m dari paras laut di Semenanjung Malaysia terdiri daripada pelbagai spesies yang unik dan ada yang terhad taburannya di hutan jenis ini sahaja. Suatu kajian telah dijalankan untuk merekodkan senarai awal spesies tumbuhan berbunga yang terdapat di sekitar Taman Eko Rimba Mossy Forest, Hutan Simpan Batu Gangan, Cameron Highlands, Pahang. Hutan ini adalah jenis hutan pergunungan atas pada ketinggian 1,900-2,000 m dari paras laut. Sebanyak 103 takson daripada 71 genus dan 42 famili telah direkodkan. Myrtaceae adalah famili terbesar dengan 12 spesies diikuti Ericaceae dan Primulaceae, masing-masing dengan lapan spesies. Pada peringkat genus, *Syzygium* (Myrtaceae) adalah genus terbesar dengan 10 takson. Kira-kira satu perlima (20.4%) atau sebanyak 21 takson yang direkodkan adalah takson yang endemik di Semenanjung Malaysia. Namun demikian, tempoh kajian selama tiga hari sahaja hanya berjaya merekodkan sebahagian daripada flora tumbuhan berbunga yang terdapat di hutan ini. Pengutipan dan tinjauan yang lebih kerap perlu dibuat pada masa hadapan untuk merekodkan lebih banyak spesies tumbuhan berbunga.

Kata kunci: tumbuhan berbunga, hutan pergunungan atas, endemik

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A Checklist of Araceae with Special Emphasis on *Arisaema Filiforme* and A. Brinchangense in Mossy Forest, Cameron Highlands, Pahang

ABSTRACT :

A total of ten species from seven genera of Araceae was collected from the Mossy Forest, Gunung Berincang, Cameron Highlands, Pahang, Peninsular Malaysia. From the list, eight species are commonly planted as edible crops or found naturally. This paper highlights two highland species: *Arisaema brichangense* and A. *filiforme*. These species are considered endangered, and because of their morphological appearances they have potential to be promoted as ornamental aroids. Updated information on these two species is provided and illustrated.

Key words: **Araceae, checklist, Arisaema, Mossy Forest, Peninsular Malaysia**

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Notes on Gingers at Mossy Forest, Cameron Highlands, Pahang

ABSTRACT :

The objective of this study was to assess the diversity of plants from Zingerberaceae family which could be found at Mossy Forest, Cameron Highlands, Pahang. Random sampling along Denai 1 Broadwalk of Mossy Forest and Denai 2 Mini Irau were done during this expedition to assess the abundance of various different ginger species within the stipulated research area. The plants and its different parts were photographed for record. The ecology of the habitat and the location coordinates for each species was collected throughout this study. The Zingerberaceae plants were identified using the keys and pictures reported by Triboun et al. (2014), Sakai et al. (1999), Khaw (2001), Poulsen (2006), Larsen et al. (1999). Geostachys megaphylla Holttum, a hyper-endemic species was found blooming along the Denai 2 trail, towards Gunung Irau peak. Several colonies of this species were found, present at different stages of reproduction (flowering, fruiting and some sterile). One colony of blooming *Meistera lappacea* (Ridl.) Škorničk. & M.F. Newman was found along Denai 1 trail. This species is just one of the three species of *Meistera* found in Peninsular Malaysia and can be seen growing at altitude of 1100-1500m. One more species, probably a Geostachys sp. was also observed in Denai 1, at 1300m. However, due to the lack of inflorescence and infructescence, this species remained unidentified. More studies must be conducted at different time period to capture the flowering stage for the species of Zingiberaceae and ease the identification step. The rediscovery of the above-mentioned species confirmed the conservation activities of sensitive species was a success in Mossy Forest albeit the tourism activities around this area.

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Pepanjat di Hutan Mossy Forest, Cameron Highlands, Pahang

ABSTRAK:

Satu kajian penilaian komposisi pepanjat telah dilaksanakan di Hutan Mossy Forest, Cameron Highlands pada bulan Mac 2023. Untuk kajian ini kandungan pepanjat dibahagikan kepada dua altitud yang berbeza iaitu pada ketinggian 2000 m asl ke atas, dan pada ketinggian 1500 sehingga 1999 m asl. Semua tumbuhan yang memanjat atau separa memanjat direkodkan di sepanjang kiri dan kanan rintis kajian (15 m di kiri dan kanan) yang sekurang-kurangnya sehingga jarak 1000 m. Spesies yang ditemui dikenalpasti di lapangan, walaupun demikian, spesimen yang tidak dapat dikenali dikutip dan dicamkan di Herbarium, Universiti Sains Malaysia menggunakan rujukan-rujukan yang sedia ada dan disimpan sebagai spesimen rujukan. Sejumlah 43 spesies pepanjat daripada 23 famili dan 26 genus telah direkodkan yang didominasikan oleh Apocynaceae, Smilacaceae dan Arecaceae dengan merujuk kepada jumlah bilangan individu dan spesies yang tertinggi. Tiga spesies pepanjat yang paling sering ditemui adalah *Medinilla clarkei* King var. *crassiramea, Persicaria chinensis* (L.) H. Gross dan *Agapetes scortechinii* (King & Gamble) Sleumer. Rintis 2000 m ke atas hanya merekodkan 19 spesies berbanding 43 untuk rintis di bawah 2000 m asl. Secara keseluruhannya kandungan spesies pepanjat adalah sangat rendah berbanding komposisi pepanjat kawasan hutan berbukit lebih rendah dan tanah rendah. Kajian-kajian lain yang lebih berfokus dan mendalam tentang ekologi dan biologi pepanjat perlu dilaksanakan secara berkala dan berterusan untuk mendapatkan maklumat yang lebih tepat dan jelas tentang pepanjat di hutan tanah tinggi dan pergunungan di Semenanjung Malaysia.

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An Update on Orchids of Mossy Forests Eco-Park, Cameron Highlands, Pahang

ABSTRACT :

Orchids are renowned as popular ornamental plants, appreciated for the aesthetic allure of their flowers. These plants not only thrive in the floriculture industry but also have the potential to boost local eco-tourism by attracting tourists to admire the beauty of orchids in their natural habitat. In Peninsular Malaysia, the mossy forest of Cameron Highlands emerges as a distinctive haven for diverse wild orchid species, some of which are confined or endemic. Unfortunately, the substantial threats of high exploitation and land-use changes are of concern, especially to these vulnerable taxa. A revision to the current inventory is crucial in improving the existing conservation and management plans. Hence, a scientific expedition was conducted from 10-14 March 2023 in Mossy Forest EcoPark, Cameron Highlands, Pahang with the objectives to identify and document the orchid flora. Employing the convenience sampling method, both sterile and fertile individuals were collected and preserved as herbarium specimens. Field visits along selected trails revealed a total of 29 species in 20 genera, including 6 terrestrials and 23 epiphytes. Notably, the study identified 5 endemic taxa: *Coelogyne carnea var. pumila, Coelogyne carnosa, Coelogyne kaliana, Coelogyne stenochila,Corybas ridleyanus* and *Corybas calopeplos.* The rare helmet orchid, *Corybas ridleyanus* and *Corybas* calopeplos were found occurring in several small populations among the thinning *Sphagnum* carpet. Though some of common species recorded 15 years ago were still there but the population size was greatly diminishing, and the plants were smaller and withering. The hiking trails were getting wider and deeper, with lots of Leptospermum's roots being exposed, evidence of erosions due to trampling by extremely high volume of indiscriminate hikers, one of worrying threat to terrestrial montane plants including orchids. Our observations suggested that serious conservation and restoration plan must be considered urgently in our bid to save and restore despite of the increasing pressure and effect of climate change.

Key words: **Diversity, mossy forest, Orchidaceae, Peninsular Malaysia**

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Liken di Mossy Forest, Gunung Brinchang dan Tanah Rata, Cameron Highlands, Pahang

ABSTRAK:

Kajian telah dijalankan untuk pengecaman spesies liken dan kajian kimia liken di Cameron Highlands bermula dalam tahun 1986. Pengutipan sampel liken di Cameron Highlands seterusnya dilakukan dalam tahun 1990, 1996, 2010 dan 2023. Dalam laporan ini kami bentangkan keputusan kajian yang terdahulu dan terkini.

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Wild Flowers Taman Eko-Rimba Mossy Forest, Cameron Highlands, Pahang

ABSTRACT :

A scientific expedition was carried out to study the wild flowers in Taman Eko-Rimba Mossy Forest, Cameron Highlands, Pahang, Malaysia. A total of 69 angiosperm taxa belonging to 25 families and 45 genera were collected, including 25 endemic species of Peninsular Malaysia. The most diverse families are Primulaceae, Ericaceae and Melastomataceae with 13, 9 and 8 species, respectively. Two species are narrow endemics of Cameron Highlands, namely *Rhaphidophora nicolsonii (Araceae)* and *Rhododendron perakense (Ericaceae).* The ornamental and medicinal values of notable species are discussed. Filetia scortechinii is an endemic shrub with beautiful sweetly fragrant flowers. Native species from several genera of important ornamental potted plants can be found in the study area: *Aeschynanthus (Gesneriaceae), Begonia (Begoniaceae), Hydrangea (Hydrangeaceae), Impatiens (Balsaminaceae)* and *Rhododendron (Ericaceae)*. Several plants were previously recorded as medicinal plants, including *Gaultheria malayana (Ericaceae), Leptospermum javanicum (Myrtaceae), Persicaria chinensis var. chinensis, P. chinensis var. ovalifolia (Polygonaceae), Plantago asiatica (Plantaginaceae)* and *Wikstroemia androsaemifolia (Thymelaeaceae).* The diversity of wild flowers in Taman Eko-Rimba Mossy Forest, Cameron Highlands has a potential to contribute to ecotourism and horticultural industries.

***Key words*: Brinchang, Irau, ornamental plants, endemic plants, montane forest**

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Kajian Perbandingan Vegetasi di Kawasan Luang Dan Terganggu Di Hutan Pergunungan Atas di Beberapa Denai Terpilih Taman Eko -Rimba Mossy Forest, Cameron Highlands, Pahang

ABSTRAK:

Kawasan hutan pergunungan atas adalah kawasan yang sensitif yang mana bila berlaku gangguan, proses penyesaran agak perlahan dibandingkan hutan tanah rendah dan bukit. Tambahan pula, kehadiran ladang-ladang pertanian yang dibuka berhampiran hutan simpan di sekitar Cameron Highlands boleh menyebabkan kehadiran spesies perintis invasif di dalam kawasan hutan yang akan menganggu ekosistem semulajadi hutan. Sebanyak empat plot kajian di kawasan denai Taman Ekorimba *'Mossy Forest'* telah dibina bagi mengukur kehadiran vegetasi perintis dan sesaran yang berlaku. Kesemua kawsan yang dipilih adalah kawasan luang dan yang terganggu secara semulajadi atau juga akibat daripada laluan pengunjung. Bancian telah dilakukan terhadap komuniti flora dari jenis pokok dan komuniti flora pada lantai hutan. Hasil kajian mendapati tiada spesies invasif asing yang ditemukan dan komuniti. Sejumlah 28 spesies pokok daripada 14 famili, 18 genus dan 28 spesies telah direkodkan yang terdiri daripada komuniti pokok hutan pergunungan yang biasa ditemui. Bagi komuniti vegetasi pada lantai hutan pula, sejumlah 28 famili dan 54 spesies telah ditemukan yang terdiri daripada paku pakis, herba, anak pokok dan pepanjat. Tiada spesies invasif asing yang ditemukan yang menunjukkan vegetasi hutan Taman Eko-Rimba *'Mossy Forest'* masih lagi tidak terkesan akibat pembangunan ladang-ladang pertanian.

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Plecoptera Composition of Mossy Forest Streams, Cameron Highlands, Pahang

ABSTRACT :

Mossy Forest Eco-Park, Cameron Highlands, Pahang serves as a conservation area which protects the ecological health of freshwater streams in the area. The freshwater streams in Mossy Forest, as they are currently stand, serve as the habitats for a diverse array of aquatic insects, including stoneflies (Insecta: Plecoptera). The aquatic insects, being integral components of the ecosystem, contribute significantly to the overall health and balance of the freshwater environment. Plecoptera is one of the pollution-sensitive aquatic insect orders and is commonly used in river health biomonitoring. Monitoring the presence and diversity of Plecoptera in freshwater can contribute to conservation efforts. Changes in their populations may signal environmental disturbances or habitat degradation. Henceforth, the aim of this preliminary study was to determine the diversity of Plecoptera in Mossy Forest's streams. Plecoptera nymphs were collected from two sites namely Brinchang Barat and Denai I by using a Surber net. In total, 214 individuals of Plecoptera were recorded with 5 genera (*Phanoperla, Peltoperlopsis, Neoperla, Indonemoura* and *Rhopalopsole*) of 4 families (*Leuctridae, Nemouridae, Perlidae* and *Peltoperlidae*). Four environmental factors that significantly influence the composition of plecopterans in the studied ecosystem were identified. The variables demonstrating a statistically significant correlation ($p < 0.05$) with plecopteran composition include: pH; water temperature; Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). These findings shed light on the current water quality status of Mossy Forest's streams and the presence of plecopterans. The establishment of this eco-park plays a crucial role in safeguarding the ecological health of the streams and consequently, ensuring conservation of a thriving habitat for aquatic insects particularly for Plecoptera.

Key words: **stoneflies, Plecoptera, water quality parameters, freshwater streams**

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Kepelbagaian Odonata di Hutan Mossy Forest, Cameron Highlands, Pahang

ABSTRAK:

Mossy Forest Cameron Highlands adalah hutan tanah tinggi. Fauna Odonata (pepatung dan pepatung jarum) dari kawasan tanah tinggi biasanya adalah unik. Setakat ini, hanya dua spesies Odonata (*Drepanosticta berinchangensis dan Procordulia artemis*) pernah direkodkan di Hutan Mossy Forest. Secara asasnya, kepelbagaian Odonata dari Hutan Mossy Forest masih belum ada kajian secara mendalam. Kehadiran spesies Odonata telah direkodkan pada 10–14 Mac 2023 dalam Ekspedisi Kepelbagaian Biologi Hutan Mossy Forest. Serangga dewasa Odonata telah ditinjau pada pelbagai habitat akuatik dalam Hutan Mossy Forest. Dalam tempoh ekspedisi ini, hanya satu spesies pepatung (satu individu betina) telah berjaya diperolehi, iaitu Amphiaeschna ampla basitincta. Spesies pepatung ini merupakan spesies yang jarang dijumpai. Spesimen A. ampla basitinca adalah rekod yang kedua bagi spesies ini di Malaysia. Setakat ini, hanya tiga spesies Odonata telah diketahui wujud di Hutan Mossy Forest.

Kata kunci: **Biodiversiti; pepatung; Semenanjung Malaysia; serangga akuatik; tanah tinggi**

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Thysanoptera (Thrips) Fauna of Mossy Forest Cameron Highlands, Pahang

ABSTRACT :

A survey of thrips was conducted during the Mossy Forest Expedition from 10-14 Mac 2023. A total of 12 species belonging to three families was collected. The majority (6 species) of the collected species were from the family Phlaeothripinae (six species), followed by Thripinae (five species) and Panchaetothripinae (one species). Two remarkable species of the genus *Liothrips* Uzel and *Asianthrips* Okajima, respectively are potentially new to science. The new species of Liothrips bears enlarged major setae on the head and pronotum which is not found in any other species of the genus. Meanwhile, the *Asianthrips* sp. found during the expedition appears in pattern coloration which is an uncommon characteristic. An annotated list of Thysanoptera collected is provided. This list is by no means exhaustive as it is based upon a limited collecting period; many further species can be certainly be expected from the highland Mossy Forest.

Key words: **Mossy Forest, Pahang, Thysanoptera.**

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Herpetofauna Diversity of Mossy Forest, Cameron Highlands, Pahang

ABSTRACT :

A survey on the herpetofauna of Mossy Forest, Gunung Brinchang, Cameron Highlands was conducted during the scientific expdition organized by the Pahang Forestry Department from 10-14 March 2023. For this rapid survey, only the visual encounter survey method was employed to sample the herpetofauna. A total of 14 species of herpetofauna was obtained, representing four species of amphibians, and 10 species of reptiles. Future survey with a longer period and additional method such as pitfall traps should be employed to maximize the sampling effort in order to demonstrate the true diversity of herpetofauna in Mossy Forest, Gunung Brinchang.

Key words: **amphibian, reptiles, Titiwangsa Range, tropical mountain, species richness**

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A Rapid Survey of Birds in Mossy Forest, Cameron Highlands, Pahang

ABSTRACT :

Being one of the highland forests in Peninsular Malaysia, the Mossy Forest contains a variety of of flora and fauna, especially those that reside in montane habitats. Past surveys of bird species in the mossy forest were done by citizen scientists through observations. This study was conducted, as part of a biodiversity scientific expedition coducted in March 2023, to update previous records on the bird species found within the mossy forest, Cameron Highlands, Pahang. A rapid survey involving active (direct observation) and passive methods (acoustic recording) was carried out on Trails 2 and 3 as well as along the road towards the telecommunication tower. Kaleidoscope Pro software was used with reference to two online bird vocalisation databases, namely Xeno-Canto and Macaulay Library, to identify species detected by acoustic recorders. This study managed to record a total of 47 bird species consisting of 27 families. Most species recorded are commonly found in the montane habitats in Peninsular Malaysia. Referring to former records, the Bat hawk (*Macheiramphus alcinus*) is a new record for Cameron Highlands and Mossy Forest. The findings are expected to assist in framing the future conservation plan for the Mossy Forest. A more intensive and prolonged survey is needed to obtain information on the diversity and distribution of birds especially montane specialists in the Mossy Forest.

Key words: **avian species richness, bioacoustics, montane specialists, montane forest, rapid assessment**

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Notes on Mammals Recorde at Mossy Forest, Cameron Highlands, Pahang

ABSTRACT :

This study aims to compare small mammal diversity at Mossy Forests, Cameron Highlands. The main study site is the Mossy Forest, Cameron Highlands while the comparative site was Regional Environmental Awareness (R.E.A.C.H) Biodiversity Centre, Cameron Highlands, Pahang. Both sites are approximately 1.47 km apart and above 1 800 asl. The data from REACH was based on a previous study done in 2017 while 60 cage traps baited with banana and 3 camera traps were placed in the designated trails for the survey in Mossy Forest, Cameron Highlands. Opportunistic data such as sightings and photos were also collected from participants of the expedition. This short survey recorded a total of 12 species of mammals, totalling up to 17 species of mammals recorded in both mossy forest surveys. There were 3 highland endemics recorded namely *Sundasciurus tahan, N. cameroni* and *Leopoldamys ciliatus.* These 3 species are only known to occur above 1000m asl. This study has also extended the elevational distribution of Three striped ground squirrel, Lariscus insignis above 1970m asl which was previously known to only occur up to 1500m asl.

Key words: **Mossy forest, mammalian diversity, highland endemics.**

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The Potential of Risk Assessment at Mossy Forest, Cameron Highlands

ABSTRACT :

Mossy Forest is one of the eco-tourism areas in Cameron Highlands, Pahang. This location is often attract the visitors who enjoy challenge-based recreational activities and enjoy the exciting experiences offered. Among the main activities here are visiting the tea plantation nearby, orchid watching and hiking to the fascinating so-called 'Lord of the ring' forest of Gunung Irau trail. However, the high rate of visits at this location exposes visitors to the risk of incidents and accidents during activities. Furthermore, there were incidents and accidents that have been reported at this location. In relation to that, this study aims to identify and assess the risks that exist around Mossy Forest trail. Data and i nformation were collected starting on 10-14 March 2023 through expert observation using the Eco-Tourism Risk Scale Form adapted based on the Risk Management and Assessment System (RAMS). The results obtained showed that there are several parts in Mossy Forest such as slippery walkaway, steep slope and trekking trails that are risky for visitors. From this finding, there are several risk control measures suggested to the responsible party to reduce the level of risk that has been identified. The findings of this study are important to provide an interpretation of the risks caused by the dangers of humans (visitors and staff), nature and equipment, allowing improvement efforts to be carried out so that the level of visitor safety can be improved.

Key words: **Mossy Forest, Cameron Highlands, risk assessment, risk management, RAMS**

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GIS-based Cotourism Mapping for Mossy Forest, Cameron Highlands, Pahang : Potential Cartographic Features and Map Design

ABSTRACT :

Taman Ekorimba Mossy Forest, Cameron Highlands, Pahang, is a significant ecotourism spot. However, the existing ecotourism map is general and may not capture the beauty of its flora and fauna. This paper explores potential features in the forest that can be mapped using GIS and cartography approaches. A well-designed ecotourism map will provide visitors with clear and comprehensive information about natural attractions and amenities within tourist destinations. The data were obtained through notebooks, inventory forms, and geotagging camera apps during the 3-day Mossy Forest Biodiversity Scientific Expedition in 2023. The key features found were a natural environment at the highest elevations, a rich repository of montane creatures, and man-made features such as accessible roads, restrooms, trail steps, signboards, boardwalks, gazebos, and watchtowers. Visitors can also admire the beautiful mountains along Banjaran Titiwangsa and the rich biotopes associated with Cameron Highlands's natural heritage. These features could be mapped using ideal cartographic symbols and design principles, such as legibility, visual contrast, and balance, and shared on Google Maps or ArcGIS Online. An appropriate GIS-based map is crucial for displaying ecotourism datasets and feature information, enhancing user understanding, and improving the overall ecotourism experience. It is also recommended to explore innovative ways to integrate multimedia elements, interactive features, and augmented reality (AR) technologies into the proposed ecotourism map.

Key words: **Ecotourism Map, Features, GIS Cartography, Map Design, Mossy Forest,**

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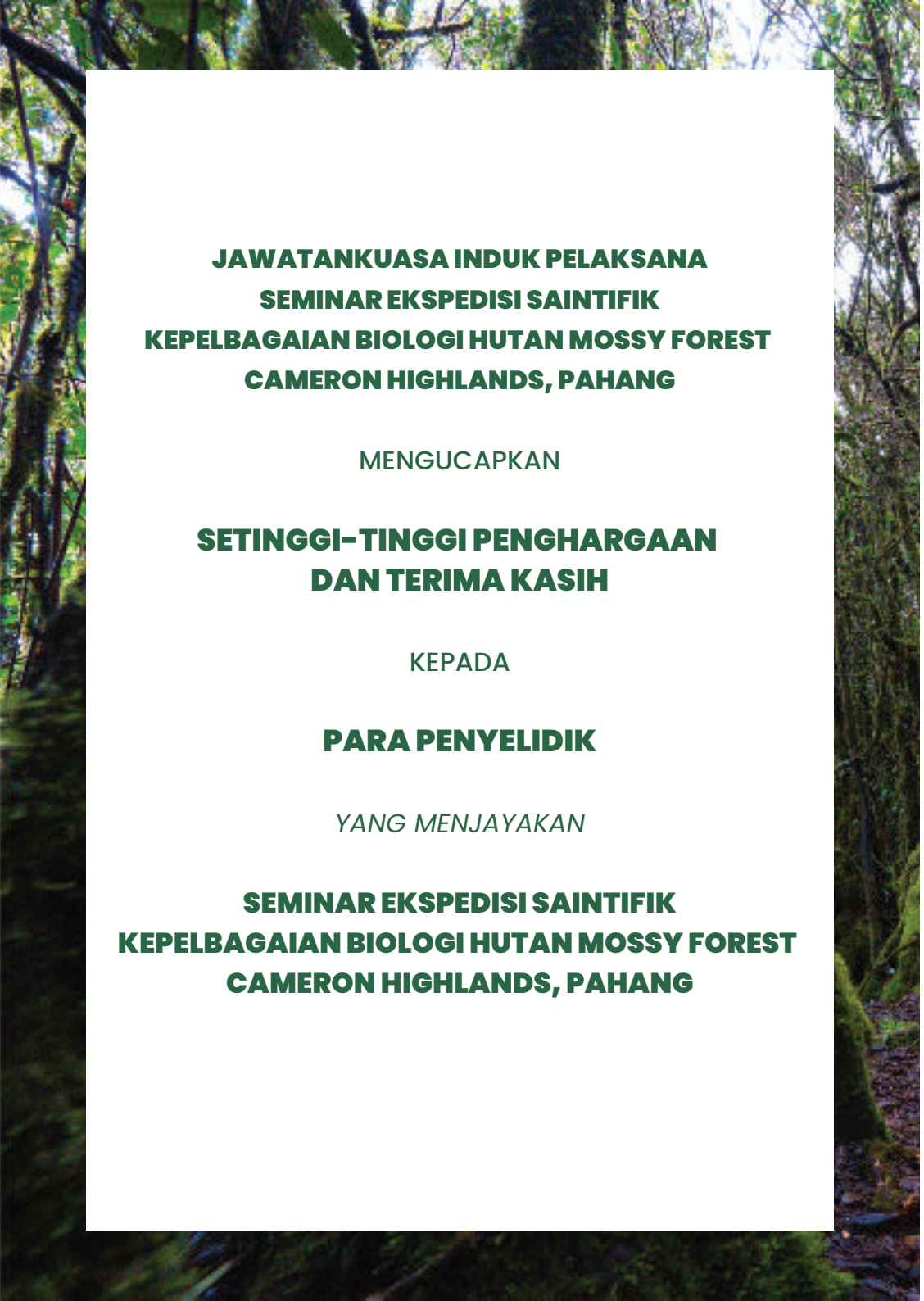
A Travel Cost Analysis of The Value of Nature Tourism Taman Eko-Rimba Mossy Forest, Cameron Highlnds, Pahang

ABSTRACT :

Travel cost analysis is a study delving preferences of park visitors and the elements that affect park visitors' choices to visit the park. Taman Eko-Rimba Mossy Forest, Cameron Highlands, Pahang has been chosen as a study area since it is a popular area among park visitors and hikers. The research aims to discern the different cost elements that tourists typically encounter while planning and undertaking their journeys to the Taman Eko-Rimba Mossy Forest. By utilizing a combination of on-site surveys, visitor interviews, and secondary data analysis, the study gathers essential information on travel-related expenses, such as transportation, accommodation, meals, entrance fees, and other incidental costs incurred during the visit. This travel cost analysis focuses on nature tourism in Taman Eko-Rimba Mossy Forest. Questionnaire surveys in the form of google form link and QR code were distributed among the park visitors. A total of 385 respondents participated in the study. The results showed that financial consequences of nature tourism affected and educate parks visitors through informed decisions and great plan optimizing their spending at Taman Eko-Rimba Mossy Forest. The study also provide insight on the vital information for politicians, local people, and conservationists, enabling data-driven decision-making to encourage responsible and sustainable management of Taman Eko-Rimba Mossy Forest. From the observations approach, it underlines the need of maintaining natural habitats while exploiting their potential for economic development through responsible nature tourism. Overall, this travel cost analysis provides important suggestions for travelers wishing to explore Taman Eko-Rimba Mossy Forest. The study underlines the significance of budget planning and responsible tourist practices to promote a harmonious interaction between nature tourism and the maintenance of the forest's biological integrity. By presenting extensive insights into the financial elements of nature tourism, this study helps to the sustainable development and conservation activities of Taman Eko-Rimba Mossy Forest, promoting the region as a major nature tourist destination in Malaysia.

Key words: **Mossy Forest, Cameron Highlands, Travel Cost Analysis (TCA), Nature Tourism, Sustainable Management**



JAWATANKUASA INDUK PELAKSANA
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CAMERON HIGHLANDS, PAHANG

MENGUCAPKAN

SETINGGI-TINGGI PENGHARGAAN DAN TERIMA KASIH

KEPADA

PARA PENYELIDIK

YANG MENJAYAKAN

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Mossy
Forest
Taman Dalam Awan