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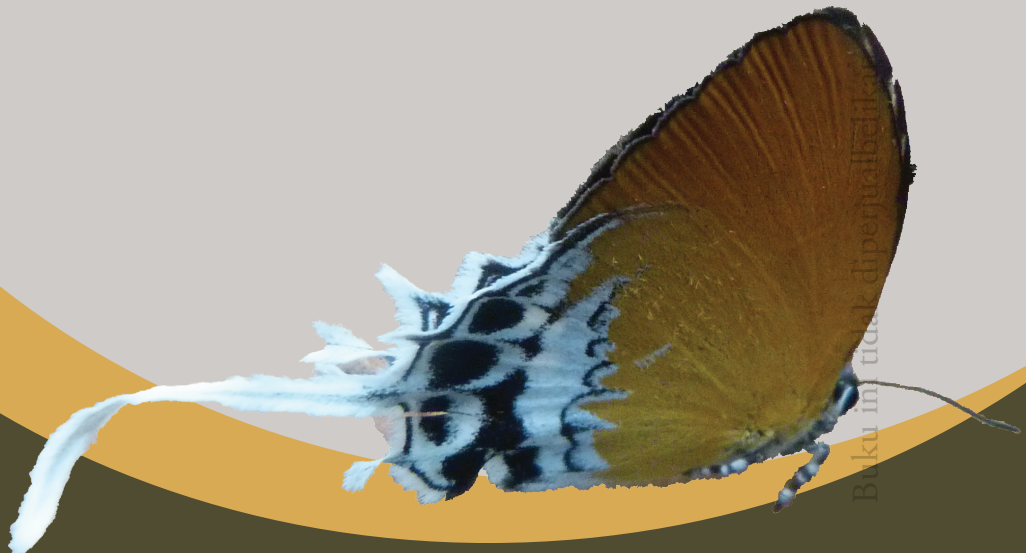
The Butterflies of Jambi (Sumatra, Indonesia): An EFForTS Field Guide



• Rawati Panjaitan • Purnama Hidayat •
• Djunijanti Peggie • Damayanti Buchori •
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Ecological and Socioeconomic Functions of Tropical Lowland Rainforest Transformation Systems (Sumatra, Indonesia)

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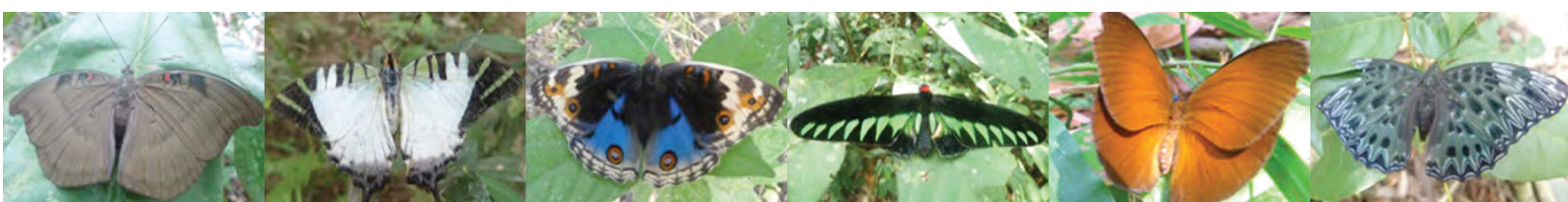

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PREFACE

Butterflies (Lepidoptera: Papilionoidea) are enigmatic insects with large, colorful wings, which receive much affection and interest by private citizens and scientific professionals alike. Due to the ease with which they can be spotted and identified to species, butterflies are often used to quantify environmental change. Being herbivores as larvae, pollinators as imago, and food for other arthropods and vertebrates in both stages, butterflies are important components of terrestrial ecosystems around the globe. Relationships between plants and butterflies can be species specific, with larvae or imago sometimes feeding only on a single host plant species, thereby contributing to the overall biodiversity of butterflies, but also their vulnerability in a changing world. The butterflies presented in this book are the result of observations conducted in natural rainforest and three agroforest systems (jungle rubber, rubber, and oil palm) in the lowlands of Jambi Province, Sumatra. Detailed analyses of butterfly abundance, diversity, and community composition across these four land-use systems have been published in Panjaitan et al.(2019, 2020) and formed part of an integrative biodiversity analysis by Grass et al. (2020).

We thank Davig Darusman, Juwita Sihombing, Norman Marbun and Somad for invaluable help in collecting, photographing, and identifying butterflies in the field. We thank village leaders, local plot owners, PT Humusindo, Harapan Rainforest/PT REKI, and Bukit Duabelas National Park for granting us access to and use of their properties. Images for this guide were taken by Rawati Panjaitan during visits to field sites of the EFForTS project in Jambi Province, Indonesia, which were funded by the EFForTS Access-and-Benefit-Sharing (ABS) fund (https://www.uni-goettingen.de/en/310995.html). EFForTS is funded by the German Research Foundation DFG as the Collaborative Research Centre CRC990, project number 192626868. Rawati Panjaitan was funded by an Indonesian Education Scholarship BPI through the National Trust for Education Development DPPN, managed by the Indonesian Endowment Fund for Education. Lastly, authors would also like to thank all those who could not be mentioned individually but who contributed to the publication of this book. Hopefully it can be useful for butterfly enthusiasts in biodiversity education in Indonesia.

Bogor, December 2020

FOREWORD

Indonesia has a high diversity of biodiversity, so it is known as a mega diversity country. Biodiversity refers to the variety of biological resources that can be seen from the ecosystem level, species diversity, and genetic diversity. Deforestation causes habitat loss, degradation, and fragmentation, leading to a decline in biodiversity. Various attempts have been made to reduce deforestation, but have not shown optimal results. Currently conservation areas and protected forests are fragmented so that habitat connectivity within and between areas is disturbed, which triggers a decline in biodiversity. It is unfortunate when the biodiversity data contained in fragmented forest areas has not been documented much, including butterflies.

The number of butterfly species that have been identified in the world is around 17,500 species or about 12% of the total 155,000 species of Lepidoptera that have been identified in the world. Identified butterflies in Indonesia is known to be approximately 2,000 species, which are scattered throughout the Indonesian archipelago. The number of butterflies found in Sumatra is estimated to be around 890 known species. The number of species contained in this book, which is documented from parts of Jambi, is 197 species.

This is the first handbook to present the distribution, habitats, names, and pictures of butterfly species in one of the richest biodiversity in tropical rainforests, Jambi, Sumatra. This guidebook provides information about the locations where butterfly species from the Papilionidae, Pieridae, Nymphalidae, Lycaenidae, and Riodinidae families were found from tropical rainforest areas, especially from the Bukit Duabelas landscape and Hutan Harapan Jambi. This manual is suitable not only for specialists but also students, forest managers, and beginners or young people who are interest to learn about butterflies. This book is presented in English so that it will also be of use to international researchers. In addition, images of species are also provided to make them more attractive.

Our knowledge of butterflies in Jambi is still very little compared to other regions in Indonesia. Given this starting point, I have full confidence that this handbook will certainly be of use to researchers and students in the field and those interested in the diversity of butterfly species. I hope this will open the door to wonderful interactions with both local and international researchers in the future.

Bogor, December 2020

Prof. Dr. Ir. Dadang, MSc.
President of the Entomological Society of Indonesia

1. INTRODUCTION

Butterflies are probably the most enigmatic insects among the arthropods. For centuries, both professional scientists and amateur enthusiasts have collected, catalogued, and scientifically described butterflies from all over the world. Unsurprisingly, they belong to the most well-known insect groups in terms of taxonomy and global species record completeness. More than 17,500 described species are spread throughout the entire world, with the exception of Antarctica. Many species migrate annually to avoid unfavorable conditions in temperate regions. While most migrate only short distances of a few hundred kilometers, monarch butterflies and several other species can migrate up to thousands of kilometers, often over several generations per migration cycle.

Butterflies have the typical four-staged insect life cycle of the holometabolous insects, which includes egg, larva, pupa, and adult. The larvae differ greatly from the adults and are called caterpillars. Almost exclusively herbivorous, caterpillars are voracious feeders and some species can be severe agricultural pests. Larva of other butterflies are highly valued as sources of silk, food, or pest plant control. In the tropics, many butterflies have several generations per year, where the adult stage lasts about two months. Within the framework of the EFForTS Project, we counted and collected butterflies in a nested replicated design in four land use systems in Jambi Province, Sumatra, Indonesia: Old growth secondary lowland rainforest, jungle rubber (a form of extensive rubber cultivation), monoculture plantations of rubber, and oil palm (Fig. 1a–d).

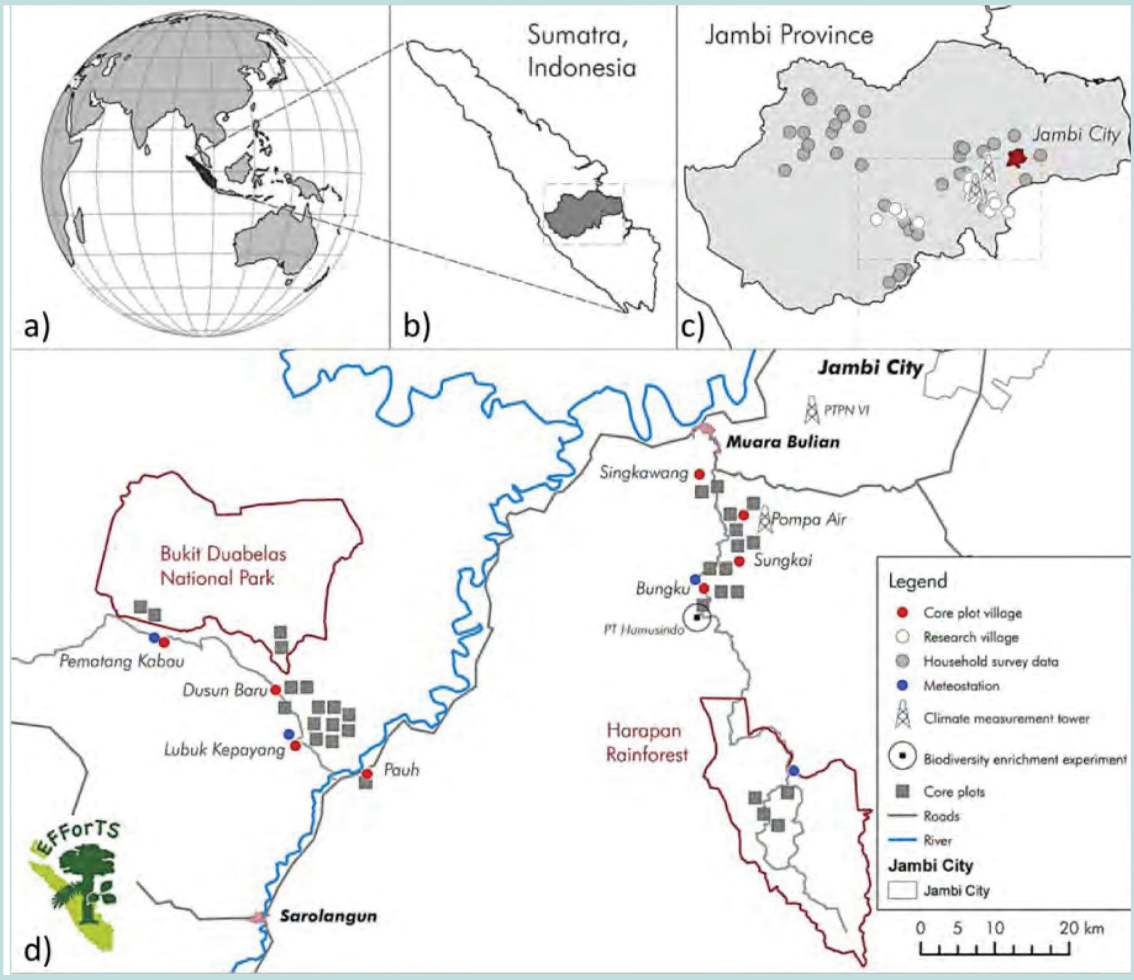
Note: (a) Old-growth secondary forest F, (b) Jungle rubber J (extensive rubber cultivation), (c), Rubber plantation R (*Hevea brasiliensis*) and (d) Oil Palm plantation O (*Elaeis guineensis*).

Source: Drescher et al. (2016)

Figure 1. Four land use systems are investigated in EFForTS.

The *EFForTS* study sites are located in and around two forest reserves, i.e. the Bukit Duabelas National Park and the lowland rainforest restoration concession of PT Restorasi Ekosistem Indonesia (PT REKI), also called Harapan Rainforest. In each of the two 'landscapes', we established a mirrored design of four plots of each land use type in each of the two landscapes, resulting in 4 × 4 × 2 = 32 'core plots' (Fig. 2). Each core plot measures 50 × 50 m. Butterflies were collected between August and October 2017 using sweep netting (exception: *Troides amphrysus* CRAMER 1779, identified on sight) on three parallel transects per core plot, with two transects located on the outer borders of the core plots, and the third transect located through the center of the core plot. Sweep netting was conducted twice per day per plot, mornings (8:00–11:00 am) and afternoons (13:00–16:00 pm). All butterfly individuals were released after identification in the evenings of the sampling day, with the exception of up to two dried/mounted individuals and five individuals in 99% EtOH p.A. per species, which were kept for species ID and further analysis. Our data is based on 6,653 caught and/or observed butterfly individuals that we identified to 197 species from 106 genera, 19 subfamilies, and 5 families.

This guide contains a checklist and images of all 197 species observed and collected. It provides scientists working in the region with an easy to use reference, and will be updated regularly.



Note: The core plot design (grey squares) is mirrored in two landscapes within and adjacent to two lowland rainforests, i.e. the Bukit Duabelas National Park and the Harapan Rainforest. Circles represent study villages and sites for socioeconomic surveys.

Source: Drescher et al. (2016)

Figure 2. EFForTS study sites in Sumatra (a, b) and Jambi Province (c, d).

2. SPECIES CHECKLIST

This is a list of the 197 species we encountered in Jambi during visits to all EFForTS core plots in Jambi dry season 2017. It contains the taxonomic resolution from family and subfamily to species, the land use systems the species were found in (i.e. lowland rainforest F, jungle rubber J, rubber monoculture R, and oil palm plantation O), and the figure numbers of the image section.

FAMILY	SUBFAMILY	BUTTERFLY SPECIES	LAND USE	FIGURES
PAPILIONIDAE	PAPILIONIDAE	*Atrophaneura priapus* (Boisduval, 1836)	F, J	3
		Graphium agamemnon (Linnaeus, 1758)	F, J, O, R	4
		Graphium antiphates (Cramer, 1775)	F, J, O, R	5
		Graphium evemon (Boisduval, 1836)	F, J	6
		Graphium ramaceus Westwood, 1872	F, R	7
		Graphium sarpedon (Linnaeus, 1758)	F, J, O	8
		Pachliopta antiphus (Fabricius, 1793)	J, O, R	9
		Papilio demoleus Linnaeus, 1758	F, J, O, R	10
		Papilio demolion Cramer, 1776	J	11
		Papilio helenus Linnaeus, 1758	F, J, O, R	12
		Papilio iswaroides Fruhstorfer, 1898	F, J, O, R	13
		Papilio memnon Linnaeus, 1758	F, J, O, R	14
		Papilio nephelus Boisduval, 1836	F, J, O, R	15
		Papilio polytes Linnaeus, 1758	F, J, O, R	16
		Trogonoptera brookiana (Wallace, 1855)	F	17
		Troides amphrysus (Cramer, 1779)	F	18

FAMILY	SUBFAMILY	BUTTERFLY SPECIES	LAND USE	FIGURES
PIERIDAE	COLIADINAE	*Catopsilia pomona* (Fabricius, 1775)	O, R	19
		Catopsilia scylla (Linnaeus, 1763)	J, O, R	20
		Eurema alitha (Felder & Felder, 1862)	F, J, O	21
		Eurema hecabe (Linnaeus, 1758)	F, J, O, R	22
		Eurema simulatrix (Staudinger, 1891)	F, J, O, R	23
		Gandaca harina (Horsfield, 1829)	F, J, O, R	24
	PIERINAE	*Appias lyncida* (Cramer, 1777)	O	25
		Appias olferna Swinhoe, 1890	F, J, O, R	26
		Appias pandione Geyer, 1832	F	27
		Leptosia nina (Fabricius, 1793)	F, J, O, R	28
		Udaiana cynis Hewitson, 1866	R	29
NYMPHALIDAE	APATURINAE	*Eulaceura osteria* (Westwood, 1850)	F, J, R	30
		Euripus nyctelius (Doubleday, 1845)	F, J	31
	BIBLIDINAE	*Ariadne ariadne* (Linnaeus, 1763)	F, J, O, R	32
		Laringa castelnaui (Felder, 1860)	J	33
		Laringa horsfieldii (Boisduval, 1833)	F	34
	CHARAXINAE	*Agatasa calydonia* (Hewitson, 1855)	F, J	35
		Charaxes durnfordi Distant, 1884	F	36
		Charaxes bernardus (Fabricius, 1793)	F, J, O, R	37
		Charaxes solon (Fabricius, 1793)	J	38
		Charaxes (Polyura) hebe (Butler, 1865)	F, J, O, R	39
		Prothoe franck (Godart, [1824])	F, J	40
	CYRESTINAE	*Chersonesia rahria* (Moore, [1858])	F, J	41
		Dichorragia nesimachus (Boisduval, 1836)	F	42

FAMILY	SUBFAMILY	BUTTERFLY SPECIES	LAND USE	FIGURES
NYMPHALIDAE	DANAINAE	*Danaus genutia* (Cramer, [1779])	F	43
		Euploea algea (Godart, [1819])	F	44
		Euploea crameri Lucas, 1853	F, J, O, R	45
		Euploea phaenareta (Schaller, 1785)	F, J, O, R	46
		Euploea mulciber (Cramer, [1777])	F, J, O, R	47
		Euploea radamanthus (Fabricius, 1793)	F	48
		Idea lynceus (Drury, 1773)	F, J	49
		Ideopsis gaura (Horsfield, [1829])	F, J, O	50
		Ideopsis juventa (Cramer, [1777])	F, J, O, R	51
		Ideopsis vulgaris (Butler, 1874)	F, J, O, R	52
		Parantica aspasia (Fabricius, 1787)	F, J, O, R	53
		Parantica luzonensis (Felder & Felder, 1863)	F	54
	HELICONIINAE	*Acraea terpsicore* (Linnaeus, 1758)	J, O, R	55
		Cethosia hypsea Doubleday, 1847	F, J, O, R	56
		Cirrochroa emalea (Guérin-Méneville, 1843)	F, J	57
		Cirrochroa orissa Felder, 1860	F	58
		Cupha erymanthis (Drury, 1773)	F, J, O, R	59
		Phalanta phalantha (Drury, (1773)	R	60
		Terinos terpander Hewitson, 1862	F, J, O	61
		Vindula erota (Fabricius, 1793)	F, J, O	62
	LIMENITIDINAE	*Athyma kanwa* (Moore, 1858)	F, J, O, R	63
		Athyma asura (Moore, 1858)	F	64
		Athyma pravara (Moore, 1857)	F, J	65
		Athyma perius (Linnaeus, 1758)	F, O, R	66
		Athyma reta (Moore, 1858)	F	67
		Bassarona dunya (Doubleday, 1848)	F	68
		Bassarona teuta (Doubleday, 1848)	F	69
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		Euthalia agnis Vollenhoven, 1862	F, J, O, R	72
		Euthalia alpheda Godart, 1823	F, J, O, R	73
		Euthalia kanda Moore, 1859	R	74

FAMILY	SUBFAMILY	BUTTERFLY SPECIES	LAND USE	FIGURES
NYMPHALIDAE	LIMENITIDINAE	*Euthalia mahadeva* Moore, 1859	J, O, R	75
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		Euthalia monina (Fabricus, 1787)	F, J, O, R	77
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		Moduza procris (Cramer, 1777)	F, J, O, R	82
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		Neptis hylas (Linnaeus, 1758)	F, J, O, R	84
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		Neptis duryodana Moore, 1858	R	86
		Pandita sinope Moore, 1857	F, O, R	87
		Pantoporia aurelia Staudinger, 1886	F	88
		Tanaecia coelebs Corbet, 1941	F, J, O, R	89
		Tanaecia elone de Niceville, 1893	F, J, O, R	90
		Tanaecia palguna (Moore, 1858)	F, J, O, R	91
		Tanaecia pelea (Fabricius, 1787)	F, J, O	92
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FAMILY	SUBFAMILY	BUTTERFLY SPECIES	LAND USE	FIGURES
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		Miletus gopara de Niceville, 1890	J	149
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		Anthene lycaenina Felder, 1868	F	152
		Caleta elna (Hewitson, 1876)	F	153
		Discolampa ethion (Westwood, 1851)	R	154
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		Everes lacturnus (Godart, [1824])	F, O	156
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		Jamides celeno (Cramer, 1775)	F, J, O, R	158
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		Neopithecops zalmora (Butler, 1870)	F, J	165
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		Zizula hylax (Fabricius, 1775)	O, R	167
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LYCANEIDAE	THECLINAE	*Arhopala agesias* Hewitson, 1862	F, J, R	169
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		Drupadia niasica (Rober, 1886)	F, J	178
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		Taxila haquinus (Fabricius, 1793)	F, J, O	197
		Zemeros emesoides Felder & Felder, 1860	F, J, O, R	198
		Zemeros flegyas (Cramer, 1780)	R	199

3. DISTRIBUTION AND IMAGES OF SPECIES

The distribution in this book refers to the discovery of specimens at the research location in Jambi, which is part of the Sumatra region. Distribution also refers to libraries: Parsons (1999), D'Abrera (1990), Tsukada and Nishiyama (1981), Tsukada and Nishiyama (1982), Tsukada and Nishiyama (1985), Tsukada (1991), and Seki et al. (1991).

A. FAMILY PAPILIONIDAE

Subfamily Papilioninae

Subfamily Papilioninae which belongs to family Papilionidae consists of 16 species. Below is the explanation for each species.

Figure 3. *Atrophaneura priapus*

1. *Atrophaneura priapus* (Boisduval, 1836)

Distribution : Sumatra and Java
Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 4. *Graphium agamemnon*

2. *Graphium agamemnon* (Linnaeus, 1758)

Distribution : Sumatra, China, Thailand, Burma, India, Philippines, Borneo, Java, Sri Lanka, Nias, Lombok, Sumba, Flores, Celebes, Halmahera, Ambon, Buru, New Guinea, Quensland, Florida, Rendova, Shortland, New Ireland, and Lousiades.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 5. *Graphium antiphates*

3. *Graphium antiphates* (Cramer, 1775)

Distribution : Sumatra, India, Srilanka, Thailand, Malay Peninsula, Indochina, Nias, Java, Bali, Celebes, Sumbawa, Flores, Alor, and Lombok.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 6. *Graphium evemon*

4. *Graphium evemon* (Boisduval, 1836)

Distribution : Sumatra, Buru, Ambon, India, Assam, Burma, Thailand, Indochina, Hainan, Andaman, Malay Peninsula, Borneo, Palawan, Java, Mentawai, Sangir, Celebes, Sumbawa, Flores, Halmahera, Ternate, Alor, Wetar, Babar, Kai, New Ireland, Irian, New Guinea, and Queensland.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 7. *Graphium ramaceus*

5. *Graphium ramaceus* Westwood, 1872

Distribution : Sumatra, Malay, and Borneo
Land Use : Lowland rainforest (F) and Rubber monoculture (R)

Figure 8. *Graphium sarpedon*

6. *Graphium sarpedon* (Linnaeus, 1758)

Distribution : Sumatra, Srilanka, India, Japan, Philipines, Thailand, Malay Peninsula, New Britain, Shortland, Quensland, New Georgia, Indochina, Java, Bali, Nias, Celebes, Sumbawa, Flores, Timor, Kai, Aru, New Guinea, and Sumba.
Land Use : Lowland rainforest (F), Jungle rubber (J), and Oil palm plantation (O)

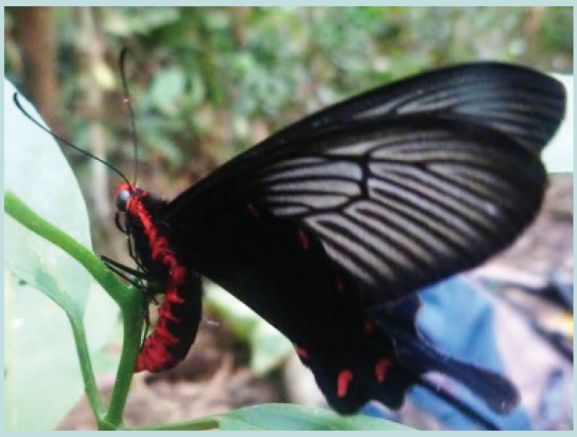

Figure 9. *Pachliopta antiphus*

7. *Pachliopta antiphus* (Fabricius, 1793)

Distribution : Sumatra, India, Assam, Sri Lanka, China, Malay Peninsula, Sabang, Borneo, Nias, Natuna, Java, Bali, Lombok, Sumba, and Flores.
Land Use : Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 10. *Papilio demoleus*

8. *Papilio demoleus* Linnaeus, 1758

Distribution : Sumatra, China, Hainan, India, Arabia, Iran, Sri Lanka, Burma, Thailand, Malay Peninsula, Australia, New Guinea, Flores, Alor, and Talaud.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 11. *Papilio demolion*

9. *Papilio demolion* Cramer, [1776]

Distribution : Sumatra, India, Malay Peninsula, Java, Bali, Lombok, Banka, and Borneo.

Land Use : Jungle rubber (J)

Figure 12. *Papilio helenus*

10. *Papilio helenus* Linnaeus, 1758

Distribution : Sumatra, China, India, Indochina, India, Sri Lanka, Timor, Java, Bali, Lombok, Nias, Sumba, Flores, Korea, and Japan.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 13. *Papilio iswaroides*

11. *Papilio iswaroides* Fruhstorfer, 1898

Distribution : Suamatra, Malay Peninsula, and Borneo.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 14. *Papilio memnon*

12. *Papilio memnon* Linnaeus, 1758

Distribution : Sumatra, India, China, Hainan, Burma, Malay Peninsula, Thailand, Okinawa, Japan, Indochina, Nias, Batu, Borneo, Java, Bali, Lombok, Sumba, and Flores.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 15. *Papilio nephelus*

13. *Papilio nephelus* Boisduval, 1836

Distribution : Sumatra, Assam, Sikkim, Nepal, Burma, Thailand, Indochina, Malay Peninsula, Hainan, Borneo, Nias, Batu, Mentawai, and Java.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 16. *Papilio polytes*

14. *Papilio polytes* Linnaeus, 1758

Distribution : Sumatra, Sri Lanka, India, Sikkim, Burma, Thailand, Malay Peninsula, China, Vietnam, Borneo, Lombok, Sumbawa, and Celebes.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 17. *Trogonoptera brookiana*

15. *Trogonoptera brookiana* (Wallace, 1855)

Distribution : Sumatra, Malay Peninsula, and Borneo.

Land Use : Lowland rainforest (F)

Figure 18. *Troides amphrysus*

16. *Troides amphrysus* (Cramer, [1779])

Distribution : Sumatra, Malay Peninsula, Nias, Borneo, and Java.

Land Use : Lowland rainforest (F)

B. FAMILY PIERIDAE

Family Pieridae consists of two subfamilies, they are:

a. Subfamily Coliadinae

b. Subfamily Pierinae.

a. Subfamily Coliadinae

Subfamily Coliadinae consists of six species. Below is the explanation for each species.

Figure 19. *Catopsilia pomona*

1. *Catopsilia pomona* (Fabricius, 1775)

Distribution : Sumatra, China, India, Philippines, Sundaland, Australia, Java, Borneo, Nias, and Celebes.

Land Use : Oil palm plantation (O) and Rubber monoculture (R)

Figure 20. *Catopsilia scylla*

2. *Catopsilia scylla* (Linnaeus, 1763)

Distribution : Sumatra, Burma, Thailand, Australia, Moluccas, Philipines, Timor, Java, Bali, Borneo, Lombok, Sumbawa, Flores, Banggai, and Celebes.

Land Use : Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 21. *Eurema alitha*

3. *Eurema alitha* (Felder & Felder, 1862)

Distribution : Sumatra, New Guinea, Java, Bali, Lombok, Borneo, Samar, Sula, Ambon, Seram, and Celebes.

Land Use : Lowland rainforest (F), Jungle rubber (J), and Oil palm plantation (O)

Figure 22. *Eurema hecabe*

4. *Eurema hecabe* (Linnaeus, 1758)

Distribution : Sumatra, Japan, Formosa, China, Nepal, Indochina, Malay Peninsula, Sundaland, Philippines, India, Sri Lanka, Natuna, New Guinea, Australia, New Caledonia, Calorin, Fiji, Nias, Borneo, Java, Bali, Ambon, Solomon, and New Ireland.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 23. *Eurema simulatrix*

5. *Eurema simulatrix* (Staudinger, 1891)

Distribution : Sumatra, Burma, Thailand, Vietnam, Malay Peninsula, Langkawi, Samar, Celebes, Palawan, and Borneo.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 24. *Gandaca harina*

6. *Gandaca harina* (Horsfield, 1829)

Distribution : Sumatra, Assam, Sikkim, Andaman, Burma, Thailand, China, Philippines, Malay Peninsula, Borneo, Java, and Nias

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

b. Subfamily Pierinae

Subfamily Pierinae consists of five species. Below is the explanation for each species.

Figure 25. *Appias lyncida*

1. *Appias lyncida* (Cramer, 1777)

Distribution : Sumatra, China, India, Burma, Thailand, Vietnam, Sri Lanka, Malay Peninsula, Borneo, Nias, Java, Lombok, Timor, Bali, and Celebes.

Land Use : Oil palm plantation (O)

Figure 26. *Appias olferna*

2. *Appias olferna* Swinhoe, 1890

Distribution : Sumatra, Indochina, Malay Peninsula, and Java.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 27. *Appias pandione*

3. *Appias pandione* Geyer, 1832

Distribution : Sumatra, Thailand, Malay Peninsula, Borneo, Java, Lombok, and Bali.

Land Use : Lowland rainforest (F)

Figure 28. *Leptosia nina*

4. *Leptosia nina* (Fabricius, 1793)

Distribution : Sumatra, India, Sri Lanka, Indochina, Hainan, Malay Peninsula, Borneo, Java, Bali, Palawan, Luzon, and Celebes.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 29. *Udaiana cynis*

5. *Udaiana cynis* Hewitson, 1866

Distribution : Sumatra, Thailand, Malay Peninsula, Borneo, and Aur.

Land Use : Rubber monoculture (R)

C. FAMILY NYMPHALIDAE

Family Nymphalidae consists of ten subfamilies, they are:

a. Subfamily Apaturinae,
b. Subfamily Biblidinae,
c. Subfamily Charaxinae,
d. Subfamily Cyrestinae,
e. Subfamily Danainae,
f. Subfamily Heliconiinae,
g. Subfamily Limenitidinae,
h. Subfamily Morphinae,
i. Subfamily Nymphalinae, and
j. Subfamily Satyrinae.

a. Subfamily Apaturinae

Subfamily Apaturinae consists of two species. Below is the explanation for each species.

Figure 30. *Eulaceura osteria*

1. *Eulaceura osteria* (Westwood, 1850)

Distribution : Sumatra, India, Myanmar, Indochina, Malaysia, Singapore, Hainan, Boreno, Natuna, Jemaja, Karimata, Belitung, Nias, Siberut, and Java.

Land Use : Lowland rainforest (F), Jungle rubber (J), and Rubber monoculture (R)

Figure 31. *Euripus nyctelius*

2. *Euripus nyctelius* (Doubleday, 1845)

Distribution : Sumatra, Nepal, India, Myanmar, Indochina, Hainan, Borneo, Palawan, Balabac, Malaysia, Bangka, Singkep, Nias, Pagai, Java, Bali, Luzon, Mindoro, Negros, Panay, Mindanao, Bohol, Samar, and Leyte.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

b. Subfamily Biblidinae

Subfamily Biblidinae consists of three species. Below is the explanation for each species.

Figure 32. *Ariadne ariadne*

1. *Ariadne ariadne* (Linnaeus, 1763)

Distribution : Sumatra, India, Sri Lanka, Burma, Java, Lombok, Flores, Alor, and Borneo.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 33. *Laringa castelnaui*

2. *Laringa castelnaui* (Felder, 1860)

Distribution : Sumatra, Peninsula, Burma, Thailand, Malaysia, Borneo, Palawan, and Nias.

Land Use : Jungle rubber (J)

Figure 34. *Laringa horsfieldii*

3. `*Laringa horsfieldii* (Boisduval, 1833)

Distribution : Sumatra, Burma, Thailand, Andaman, Nias, and Java.

Land Use : Lowland rainforest (F)

c. Subfamily Charaxinae

Subfamily Charaxinae consists of six species. Below is the explanation for each species.

Figure 35. *Agatasa calydonia*

1. *Agatasa calydonia* (Hewitson, 1855)

Distribution : Sumatra, Myanmar, Thailand, Malaysia, Borneo, Tukangbesi, Singkep, Lingga, and Bangka.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 36. *Charaxes durnfordi*

2. *Charaxes durnfordi* Distant, 1884

Distribution : Sumatra, Myanmar, Thailand, Malaysia, Borneo, Lingga, Belitung, Sipora, and Java.

Land Use : Lowland rainforest (F)

Figure 37. *Charaxes bernardus*

3. *Charaxes bernardus* (Fabricius, 1793)

Distribution : Sumatra, Nepal, Himalaya, Myanmar, Indochina, Hongkong, Malaysia, Karimata, Belitung, Bangka, Nias, Java, Bali, Borneo, and Kangean.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 38. *Charaxes solon*

4. *Charaxes solon* (Fabricius, 1793)

Distribution : Sumatra, Assam, Myanmar, Indochina, India, Malaysia, Singapore, Borneo, Natuna, Karimata, Singkep, Mindanao, Tawi-tawi, Sangihe, Celebes, and Banggai.

Land Use : Jungle rubber (J)

Figure 39. *Charaxes* (*Polyura*) *hebe*

5. *Charaxes (Polyura) hebe* (Butler, 1865)

Distribution : Sumatra, Myanmar, Thailand, Malaysia, Tioman, Singapore, Borneo, Tarempa, Jemaja, Kalimantan, Singkep, Lingga, Nias, Java, Bali, Kangean, Lombok, and Sumbawa.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 40. *Prothoe franck*

6. *Prothoe franck* (Godart, [1824])

Distribution : Sumatra, Assam, Myanmar, Thailand, Indochina, Malaysia, Borneo, Palawan, Belitung, Nias, Batu, Siberut, Java, Bali, Lombok, and Flores.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

d. Subfamily Cyrestinae

Subfamily Cyrestinae consists of two species. Below is the explanation for each species.

Figure 41. *Chersonesia rahria*

1. *Chersonesia rahria* (Moore, [1858])

Distribution : Sumatra, Tioman, Aur, Palawan, Borneo, Malaysia, Simeulue, Batu, Nias, Java, Lingga, Belitung, Mentawai, Bali, Celebes, Peleng, and Sulas.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 42. *Dichorragia nesimachus*

2. *Dichorragia nesimachus* (Boisduval, 1836)

Distribution : Sumatra, India, Myanmar, Indochina, Japan, Taiwan, Malaysia, Borneo, Nias, Anambas, Java, Mindoro, Samar, Celebes, Halmahera, Sula, and Banggai.

Land Use : Lowland rainforest (F)

e. Subfamily Danainae

Subfamily Danainae consists of 12 species. Below is the explanation for each species.

Figure 43. *Danaus genutia*

1. *Danaus genutia* (Cramer, [1779])

Distribution : Sumatra, Sri Lanka, India, Formosa, Roma, Queensland, Australia, Celebes, Borneo, Java, Bali, Lombok, Sumbawa, Philippines, and Timor

Land Use : Lowland rainforest (F)

Figure 44. *Euploea algea*

2. *Euploea algea* (Godart, [1819])

Distribution : Sumatra, Nepal, Burma, Peninsula, Thailand, New Calidonia, New Guinea, Roma, Babar, Timor, Java, Bali, Misool, Nias, Batu, Belitung, Bangka, Borneo, Lombok, and Sumbawa.

Land Use : Lowland rainforest (F)

Figure 45. *Euploea crameri*

3. *Euploea crameri* Lucas, 1853

Distribution : Sumatra, Nicobar, Peninsula, Burma, Thailand, Banggi, Borneo, Bali, Lombok, Java, Nias, Batu, Bawean, and Vietnam.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 46. *Euploea phaenareta*

4. *Euploea phaenareta* (Schaller, 1785)

Distribution : Sumatra, Sri Lanka, Burma, Thailand, Vietnam, Nicobars, Ambon, Flores, Borneo, Nias, Engano, Java, Bali, Bawean, Samar, Palawan, Sulu, Talaud, Celebes, Sumbawa, Obi, Jobi, Buru, Waigeo, Papua, New Ireland, Solomons, and Admiralty.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 47. *Euploea mulciber*

5. *Euploea mulciber* (Cramer, [1777])

Distribution : Sumatra, Peninsula, India, China, Malay Peninsula, Mentawai, Bazilan, Flores, Alor, Sumba, Mindanao, Bangka, Belitung, Borneo, Nias, Java, Palawan, Luzon, Camostes, Samar, Dinagat, and Engano.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 48. *Euploea radamanthus*

6. *Euploea radamanthus* (Fabricius, 1793)

Distribution : Sumatra, Nepal, Sikkim, Assam, Burma, Thailand, Malay Peninsula, Borneo, Nias, Batu, Java, and Bunguran.

Land Use : Lowland rainforest (F)

Figure 49. *Idea lynceus*

7. *Idea lynceus* (Drury, 1773)

Distribution : Sumatra, Mergui, Peninsula, Thailand, Nias, and Borneo.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 50. *Ideopsis gaura*

8. *Ideopsis gaura* (Horsfield, [1829])

Distribution : Sumatra, Peninsula, Thailand, Mentawai, Lingga, Borneo, Batu, Nias, and Simeulue.

Land Use : Lowland rainforest (F), Jungle rubber (J), and Oil palm plantation (O)

Figure 51. *Ideopsis juventa*

9. *Ideopsis juventa* (Cramer, [1777])

Distribution : Sumatra, Camorta, Malay Peninsula, Solomons, New Guinea, Philippines, Java, Bali, Borneo, Lombok, Halmahera, Biak, Salawati, Merauke, Celebes, and Belitung.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

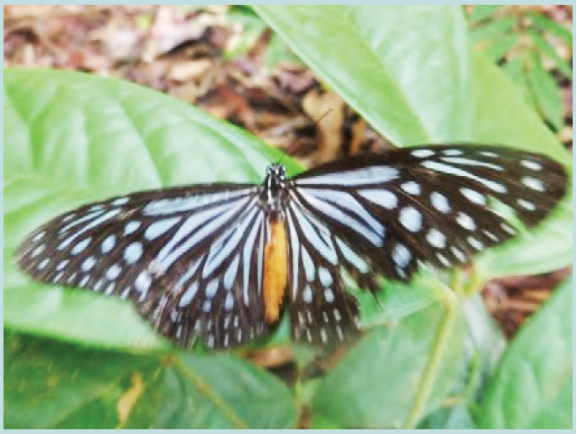

Figure 52. *Ideopsis vulgaris*

10. *Ideopsis vulgaris* (Butler, 1874)

Distribution : Sumatra, Vietnam, Thailand, Burma, Malay Peninsula, Flores, Alor, Palawan, Batu, Bangka, Nias, Mentawai, Sumba, Java, and Borneo.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

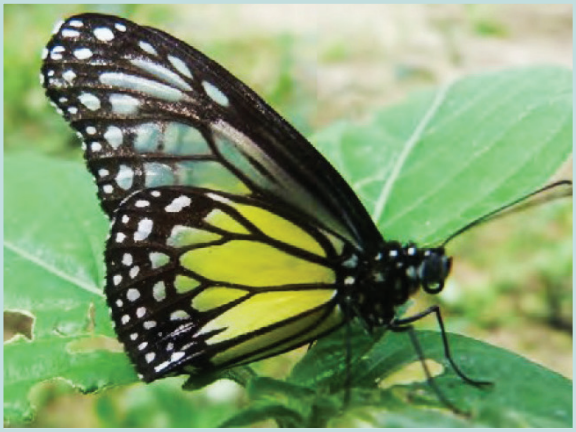

Figure 53. *Parantica aspasia*

11. *Parantica aspasia* (Fabricius, 1787)

Distribution : Sumatra, Burma, Thailand, Vietnam, Malay Peninsula, Borneo, Nias, Java, and Bali.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 54. *Parantica luzonensis*

13. *Parantica luzonensis* (Felder & Felder, 1863)

Distribution : Sumatra, Java, Sumbawa, Batu, Nias, and Borneo.

Land Use : Lowland rainforest (F)

f. Subfamily Heliconiinae

Subfamily Heliconiinae consists of eight species. Below is the explanation for each species.

Figure 55. *Acraea terpsicore*

1. *Acraea terpsicore* (Linnaeus, 1758)

Distribution : Sumatra, Indochina, Thailand, Australia, and Java.

Land Use : Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 56. Cethosia hypsea

2. *Cethosia hypsea* Doubleday, 1847

Distribution : Sumatra, Burma, Malaysia, Thailand, Lingga, Singkep, Banjak, Batu, Mentawai, Natuna, Borneo, Java, Bali, and Palawan.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 57. *Cirrochroa emalea*

3. *Cirrochroa emalea* (Guérin-Méneville, 1843)

Distribution : Sumatra, Burma, Thailand, Malaysia, Lingga, Singkep, Borneo, Nias, Java, Mentawai, and Flores.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 58. *Cirrochroa orissa*

4. *Cirrochroa orissa* Felder, 1860

Distribution : Sumatra, Thailand, Malaysia, Borneo, and Simeulue.

Land Use : Lowland rainforest (F)

Figure 59. *Cupha erymanthis*

5. *Cupha erymanthis* (Drury, 1773)

Distribution : Sumatra, India, Malaysia, Taiwan, Sri Lanka, India, Nicobar, Java, Bali, Lombok, Sumbawa, and Flores.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

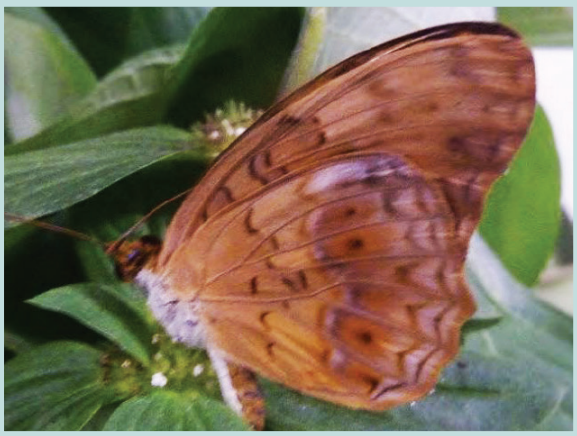

Figure 60. *Phalanta phalanta*

6. *Phalanta phalantha* (Drury, (1773)

Distribution : Sumatra, Socotra, Madagascar, Philippines, Japan, Taiwan, Nepal, Indochina, Malaysia, Lombok, Bali, Java, Borneo, Tioman, Australia, and Celebes.

Land Use : Rubber monoculture (R)

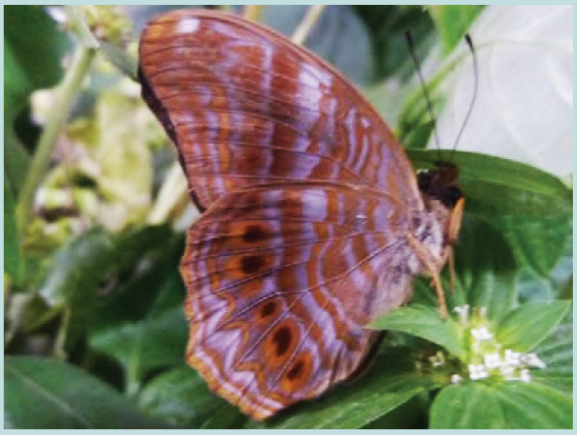

Figure 61. *Terinos terpander*

7. *Terinos terpander* Hewitson, 1862

Distribution : Sumatra, Tioman, Aur, Sumatra, Lingga, Nias, Natuna, Borneo, and Bangka.

Land Use : Lowland rainforest (F), Jungle rubber (J), and Oil palm plantation (O)

Figure 62. *Vindula erota*

8. *Vindula erota* (Fabricius, 1793)

Distribution : Sumatra, India, Indochina, India, Andaman, Hainan, Malaysia, Nias, Mentawai, Borneo, Java, Celebes, and Butung.

Land Use : Lowland rainforest (F), Jungle rubber (J), and Oil palm plantation (O)

g. Subfamily Limenitidinae

Subfamily Limenitidinae consists of 30 species. Below is the explanation for each species.

Figure 63. *Athyma kanwa*

1. *Athyma kanwa* (Moore, 1858)

Distribution : Sumatra, India, Burma, Thailand, Belitung, Nias, and Mentawai.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 64. *Athyma asura*

2. *Athyma asura* (Moore, 1858)

Distribution : Sumatra, Himalaya, Assam, Burma, Thailand, China, Tibet, Taiwan, Malaysia, Singkep, Lingga, Belitung, Borneo, Java, Palawan, and Bangka.

Land Use : Lowland rainforest (F)

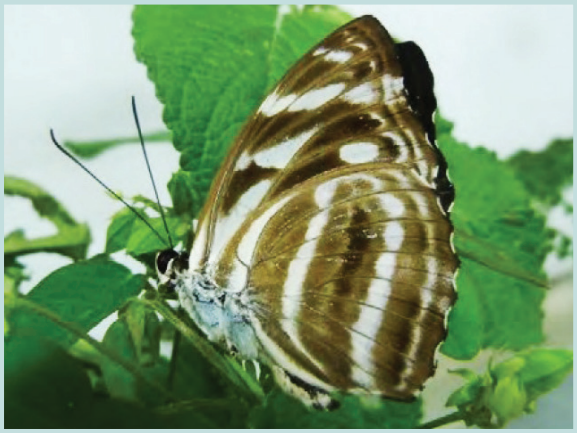

Figure 65. *Athyma pravara*

3. *Athyma pravara* (Moore, 1857)

Distribution : Sumatra, India, Burma, Thailand, Indochina, Malaysia, Borneo, Java, and Bali.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 66. *Athyma perius*

4. *Athyma perius* (Linnaeus, 1758)

Distribution : Sumatra, Indochina, Taiwan, Japan, Malaysia, Java, Madura, Bali, Kangean, Lombok, and Sumba.

Land Use : Lowland rainforest (F), Oil palm plantation (O), and Rubber monoculture (R)

Figure 67. *Athyma reta*

5. *Athyma reta* (Moore, 1858)

Distribution : Sumatra, India, Burma, Thailand, Mergui, Malaysia, Borneo, Singkep, Lingga, Belitung, Nias, Bangka, and Java.

Land Use : Lowland rainforest (F)

Figure 68. *Bassarona dunya*

6. *Bassarona dunya* (Doubleday, 1848)

Distribution : Sumatra, Palawan, Java, Bali, Nias, Mentawai, Borneo, and Malaysia.

Land Use : Lowland rainforest (F)

Figure 69. *Bassarona teuta*

7. *Bassarona teuta* (Doubleday, 1848)

Distribution : Sumatra, India, Myanmar, Thailand, Andaman, Langkawi, Borneo, Nias, Java, Lombok, Sumbawa, and Flores.

Land Use : Lowland rainforest (F)

Figure 70. *Dophla evelina*

8. *Dophla evelina* (Stoll, 1790)

Distribution : Sumatra, India, Myanmar, Thailand, Hainan, Sri Lanka, Borneo, Natuna, Tarempa, Singkep, Bangka, Belitung, Balabac, Mindoro, Mindanao, Java, and Celebes.

Land Use : Lowland rainforest (F), Jungle rubber (J), and Rubber monoculture (R)

Figure 71. *Euthalia adonia*

9. *Euthalia adonia* (Cramer, 1782)

Distribution : Sumatra, Thailand, Langkawi, Singapore, Borneo, Palawan, Natuna, Tarempa, Lingga, Bangka, Nias, Siberut, Java, Bali, and Lombok.

Land Use : Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 72. *Euthalia agnis*

10. *Euthalia agnis* Vollenhoven, 1862

Distribution : Sumatra, Malaysia, Borneo, and Java.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 73. *Euthalia alpheda*

11. *Euthalia alpheda* Godart, 1823

Distribution : Sumatra, Himalaya, India, Myanmar, Thailand, Langkawi, Bangka, Riau, Tioman, Borneo, Jemaja, Natuna, Karimata, Singkep, Nias, Siberut, Java, Bali, Palawan, Mindoro, and Mindanao.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 74. *Euthalia kanda*

12. *Euthalia kanda* Moore, 1859

Distribution : Sumatra, Myanmar, Thailand, Borneo, Natuna, and Nias.

Land Use : Rubber monoculture (R)

Figure 75. *Euthalia mahadeva*

13. *Euthalia mahadeva* Moore, 1859

Distribution : Sumatra, Myanmar, Thailand, Malaysia, Langkawi, Borneo, Natuna, Palawan, Karimata, Bongao, Java, Nias, and Bali.

Land Use : Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 76. *Euthalia merta*

14. *Euthalia merta* Moore, 1859

Distribution : Sumatra, Myanmar, Thailand, Malaysia, Langkawi, Borneo, Natuna, Bintan, Nias, and Belitung.

Land Use : Jungle rubber (J)

Figure 77. *Euthalia monina*

15. *Euthalia monina* (Fabricus, 1787)

Distribution : Sumatra, India, Myanmar, Indochina, Thailand, Langkawi, Borneo, Tarempa, Palawan, Tioman, Nias, Siberut, Bali, Java, and Lombok.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 78. *Euthalia whiteheadi*

16. *Euthalia whiteheadi* Grose-Smith, 1889

Distribution : Sumatra, Thailand, Malaysia, Borneo, Java, and Bali.

Land Use : Oil palm plantation (O)

Figure 79. *Lasippa tiga*

17. *Lasippa tiga* (Moore, 1858)

Distribution : Sumatra, Assam, Burma, Thailand, Langkawi, Banjak, Lingga, Singkep, Bangka, Nias, Mentawai, Java, and Borneo.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 80. *Lebadea martha*

18. *Lebadea martha* (Fabricius, 1787)

Distribution : Sumatra, Bhutan, Sikkim, Myanmar, Indochina, Samui, Langkawi, Malaysia, Singapore, Borneo, Sibutu, Anambas, Belitung, Bangka, Tello, Mentawai, Java, and Bali.

Land Use : Lowland rainforest (F), Jungle rubber (J)

Figure 81. *Lexias pardalis*

19. *Lexias pardalis* Moore, 1878

Distribution : Sumatra, India, Myanmar, Thailand, Indochina, Singapore, Borneo, Belitung, Musala, Malaysia, and Nias.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 82. *Moduza procris*

20. *Moduza procris* (Cramer, 1777)

Distribution : Sumatra, Nepal, India, Myanmar, Indochina, Hainan, Sri Lanka, Malaysia, Tioman, Borneo, Anambas, Natuna, Bangka, Simeulue, Musara, Java, Bali, Lombok, Sumbawa, Timor, and Flores.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 83. *Neptis harita*

21. *Neptis harita* Moore, 1874

Distribution : Sumatra, India, Burma, Thailand, Indochina, Malaysia, Borneo, and Palawan.

Land Use : Oil palm plantation (O)

Figure 84. *Neptis hylas*

22. *Neptis hylas* (Linnaeus, 1758)

Distribution : Sumatra, India, Burma, Thailand, Indochina, Taiwan, Peninsula, Sri Lanka, Andaman, Nicobars, Malaysia, Lingga, Belitung, Nias, Batu, Mentawai, Borneo, Samga Samga, Java, Bali, Lombok, Sumbawa, Flores, Pura, Alor, and Babar.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

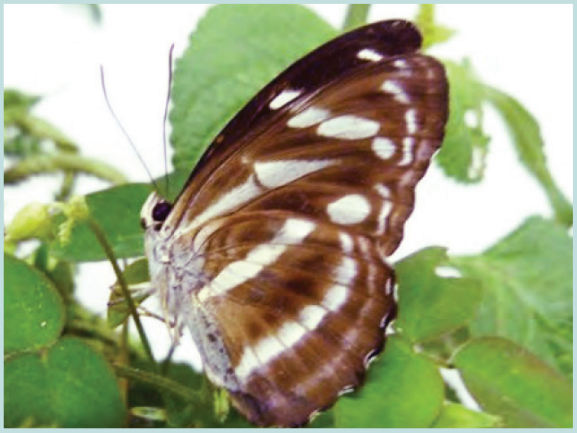

Figure 85. *Neptis nata*

23. *Neptis nata* Moore, 1857

Distribution : Sumatra, Himalaya, India, Burma, Hainan, Taiwan, Nias, Engano, Borneo, Java, Bali, Lombok, Sumbawa, and Flores.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 86. *Neptis duryodana*

24. *Neptis duryodana* Moore, 1858

Distribution : Sumatra, Thailand, Malaysia, Simeulue, Nias, Mentawai, Java, Bawean, Borneo, and Palawan.

Land Use : Rubber monoculture (R)

Figure 87. *Pandita sinope*

25. *Pandita sinope* Moore, 1857

Distribution : Sumatra, Thailand, Malaysia, Borneo, Banyak, Singkep, Lingga, Bangka, Java, and Palawan.

Land Use : Lowland rainforest (F), Oil palm plantation (O), and Rubber monoculture (R)

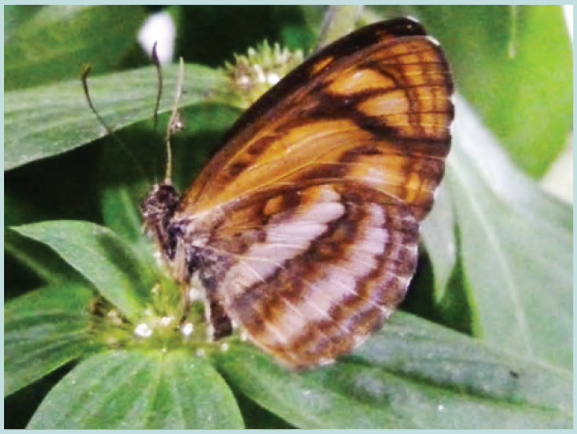

Figure 88. *Pantoporia aurelia*

26. *Pantoporia aurelia* Staudinger, 1886

Distribution : Sumatra, Assam, Burma, Thailand, Malaysia, Borneo, Banjak, and Lingga.

Land Use : Lowland rainforest (F)

Figure 89. *Tanaecia coelebs*

27. *Tanaecia coelebs* Corbet, 1941

Distribution : Sumatra, Malaysia, Natuna, and Belitung.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 90. *Tanaecia elone*

28. *Tanaecia elone* de Niceville, 1893

Distribution : Sumatra

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 91. *Tanaecia palguna*

29. *Tanaecia palguna* (Moore, 1858)

Distribution : Sumatra, Thailand, Malaysia, Bangka, Banyak, Java, Bali, and Sumbawa.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 92. *Tanaecia pelea*

30. *Tanaecia pelea* (Fabricius, 1787)

Distribution : Sumatra, Myanmar, Thailand, Malaysia, Tioman, Natuna, Serasan, Subi, Matak, Tarempa, Jemaja, Tambelans, Belitung, Borneo, Lingga, Sulus, Batu, Banyak, Simeulue, and Nias.

Land Use : Lowland rainforest (F), Jungle rubber (J), and Oil palm plantation (O)

h. Subfamily Morphinae

Subfamily Morphinae consists of 14 species. Below is the explanation for each species.

Figure 93. *Amathusia binghami*

1. *Amathusia binghami* Fruhstorfer, 1904

Distribution : Sumatra and Malaya

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 94. *Amathusia perakana*

2. *Amathusia perakana* Honrath, 1888

Distribution : Sumatra, Malaya, Borneo, and Natuna

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 95. *Amathusia phidippus*

3. *Amathusia phidippus* (Linnaeus, 1763)

Distribution : Sumatra, Burma, Malaya, Singapore, Indochina, Bangka, Borneo, Natuna, Java, Bawean, Bali, Lombok, Nias, Mentawai, Philippines, Palawan, and Celebes.

Land Use : Oil palm plantation (O)

Figure 96. *Amathusia schoenbergi*

4. *Amathusia schoenbergi* Honrath, (1888)

Distribution : Sumatra, Malaya, and Borneo.

Land Use : Lowland rainforest (F)

Figure 97. *Discophora necho*

5. *Discophora necho* Felder, 1866

Distribution : Sumatra, Malaya, Nias, Borneo, Natuna, Java, Palawan, Mindoro, and Jolo.

Land Use : Lowland rainforest (F) and Jungle rubber (J)

Figure 98. *Faunis canens*

6. *Faunis canens* Hübner, 1826

Distribution : Sumatra, Sikkim, Burma, Tonkin, Malaya, Singapore, Tioman, Nias, Batu, Java, Tello, Mentawai, Bangka, Borneo, Natuna, and Bali.

Land Use : Lowland rainforest (F), Jungle rubber (J), Oil palm plantation (O), and Rubber monoculture (R)

Figure 99. *Faunis gracilis*

7. *Faunis gracilis* Butler, 1867

Distribution : Sumatra, Malaya, and Borneo.

Land Use : Lowland rainforest (F)

Figure 100. Faunis kirata

8. *Faunis kirata* (de Nicéville, 1891)

Distribution : Sumatra, Malaya, Simeulue, and Borneo.
Land Use : Lowland rainforest (F).

Figure 101. *Xanthotaenia busiris*

9. *Xanthotaenia busiris* (Westwood, 1858)

Distribution : Sumatra, Dawna, Burma, Siam, Malaya, Simeulue, Nias, Batu, Mentawai, and Borneo.
Land Use : Lowland rainforest (F).

Figure 102. *Thaumantis klugius*

10. *Thaumantis klugius* (Zinken-Sommer, 1831)

Distribution : Sumatra, Burma, Malaya, Singapore, Borneo, and Java.
Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 103. *Thaumantis noureddin*

11. *Thaumantis noureddin* (Westwood, 1851)

Distribution : Sumatra, Malaya, Singapore, and Borneo.
Land Use : Jungle rubber (J).

Figure 104. *Thaumantis odana*

12. *Thaumantis odana* (Godart, 1824)

Distribution : Sumatra, Peninsula, Malaya, Simeulue, Nias, Borneo, and Java.
Land Use : Lowland rainforest (F).

Figure 105. *Zeuxidia amethystus*

13. *Zeuxidia amethystus* (Butler, 1865)

Distribution : Sumatra, Karen Hills, Burma, Siam, Malaya, Singapore, Siberut, Sipora, Borneo, Palawan, and Mindanao.
Land Use : Lowland rainforest (F) and jungle rubber (R).

Figure 106. *Zeuxidia doubledayi*

14. *Zeuxidia doubledayi* (Westwood, 1851)

Distribution : Sumatra, Dawna, Burma, Siam, Singapore, Simeulue, Sipora, Bangka, and Borneo.

Land Use : Lowland rainforest (F).

i. Subfamily Nymphalinae

Subfamily Nymphalinae which belongs to family Nymphalidae consists of 7 species. Below is the explanation for each species.

Figure 107. *Doleschallia bisaltide*

1. *Doleschallia bisaltide* (Cramer, 1779)

Distribution : Sumatra, Himalaya, India, Burma, Indochina, Hainan, India, Sri Lanka, Andaman, Nicobar, Malaysia, Nias, Philippines, Borneo, Java, Bali, and Lombok.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 108. *Hypolimnas bolina*

2. *Hypolimnas bolina* (Linnaeus, 1758)

Distribution : Sumatra, Madagascar, Socotra, India, Indochina, Andaman, Malaysia, Taiwan, the Philippines, Celebes, New Guinea, Ambon, Borneo, and Palawan.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 109. *Junonia almana*

3. *Junonia almana* (Linnaeus, 1758)

Distribution : Sumatra, India, Sri Lanka, Burma, Indochina, Taiwan, Japan, the Philippines, Nias, Java, Bali, Lombok, Sumbawa, Nicobar, Celebes, and Flores.

Land Use : Jungle rubber (J) and oil palm plantation (O).

Figure 110. *Junonia atlites*

4. *Junonia atlites* (Linnaeus, 1763)

Distribution : Sumatra, India, China, Thailand, Philippines, Andaman, Celebes, Sumba, Java, Papua, and Nias.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 111. *Junonia hedonia*

5. *Junonia hedonia* (Linnaeus, 1764)

Distribution : Sumatra, Malaysia, Lingga, Borneo, Palawan, Aur, Lombok, the Philippines, Sumba, Celebes, New Guinea, Australia, Seram, and Halmahera.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 112. *Junonia orithya*

6. *Junonia orithya* (Linnaeus, 1764)

Distribution : Sumatra, Africa, Madagascar, Turkey, Arabia, China, Taiwan, India, Afganistan, Thailand, Indochina, the Philippines, Palawan, Malaysia, Borneo, Java, Bali, Tanimbar, Selayar, Celebes, Moluccas, New Guinea, Bismark, and Australia.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 113. *Rhinopalpa polynice*

7. *Rhinopalpa polynice* (Cramer, 1780)

Distribution : Sumatra, Assam, Burma, Thailand, Malaysia, Tioman, Simeulue, Natuna, Borneo, Luzon, Panay, Mindanao, Bazilan, Celebes, Nias, Mentawai, Java, and Bali.

Land Use : Lowland rainforest (F).

j. Subfamily Satyrinae

Subfamily Satyrinae consists of 29 species. Below is the explanation for each species.

Figure 114. *Coelites epiminthia*

1. *Coelites epiminthia* (Westwood, 1851)

Distribution : Sumatra, Arakan, Dawna, Mergui, Siam, Malaya, Borneo, and Java.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 115. *Coelites euptychioides*

2. *Coelites euptychioides* (Felder, 1867)

Distribution : Sumatra, Malaya, Borneo, and Natuna.

Land Use : Lowland rainforest (F).

Figure 116. *Elymnias hypermnestra*

3. *Elymnias hypermnestra* (Linnaeus, 1763)

Distribution : Sumatra, Sri Lanka, India, Bengal, Dun, Langkawi, Kedah, Burma, Penang, Tioman, Malaya, Singapore, Riau, Tonkin, Fromosa, Lombok, Bali, Sumbawa, Alor, and Timor.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

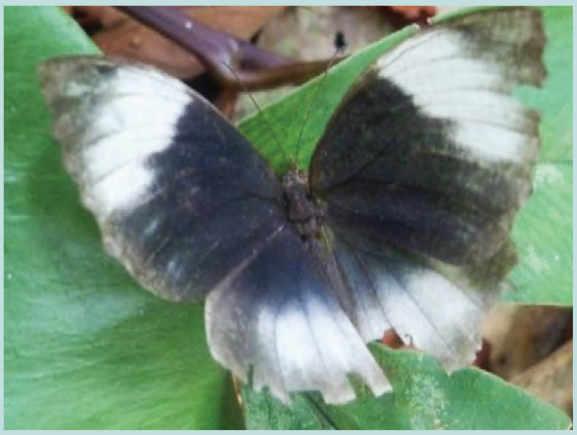

Figure 117. *Elymnias esaca*

4. *Elymnias esaca* (Westwood, 1851)

Distribution : Sumatra, Mergui, Malaya, Singapore, Borneo, Nias, Java, Bali, Negros, Mindanao, Leyte, and Batu.

Land Use : Lowland rainforest (F).

Figure 118. *Elymnias nesaea*

5. *Elymnias nesaea* (Linnaeus, 1758)

Distribution : Sumatra, Sikkim, Burma, Siam, Malaya, Borneo, Nias, Batu, Java, Bali, Bawean, and Kangean.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 119. *Elymnias panthera*

6. *Elymnias panthera* (Fabricius, 1787)

Distribution : Sumatra, Nicobar, Malaya, Singapore, Tioman, Nias, Siberut, Sipora, Java, Borneo, Bawean, Bali, and Natuna.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 120. *Elymnias penanga*

7. *Elymnias penanga* (Westwood, 1851)

Distribution : Sumatra, Assam, Burma, Peninsula, Malaya, Singapore, and Borneo.

Land Use : Lowland rainforest (F).

Figure 121. *Erites argentina*

8. *Erites argentina* (Butler, 1868)

Distribution : Sumatra, Burma, Siam, Malaya, Bangka, Java, Borneo, and Palawan.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 122. *Lethe mekara*

9. *Lethe mekara* (Moore, 1857)

Distribution : Sumatra, Sikkim, Bhutan, Assam, Burma, Siam, Tonkin, Malaya, Sipora, and Borneo.

Land Use : Lowland rainforest (F) and oil palm plantation (O).

Figure 123. *Melanitis leda*

10. *Melanitis leda* (Linnaeus, 1758)

Distribution : Sumatra, Ethiopian Region, Madagascar, Sri Lanka, India, Burma, Andaman, Indochina, Singapore, Borneo, Palawan, the Philippines, Java, Kangean, Bali, Lombok, Sumbawa, Timor, Papua, Palau, Solomons, Obi, New Guinea, and Flores.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 124. *Melanitis phedima*

11. *Melanitis phedima* (Cramer, 1782)

Distribution : Sumatra, Sri Lanka, Formosa, India, Kashmir, Burma, China, Malaya, Sipora, Nias, Engano, Java, Celebes, and Japan.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 125. *Mycalesis fusca*

12. *Mycalesis fusca* (Felder, 1860)

Distribution : Sumatra, Dawna, Burma, Peninsula, Malaya, Singapore, Riau, Lingga, Bangka, Billiton, Nias, Siberut, Sipora, Borneo, and Java.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 126. *Mycalesis dohertyi*

13. *Mycalesis dohertyi* (Elwes, 1891)

Distribution : Sumatra, Malaya, and Borneo.

Land Use : Lowland rainforest (F), jungle rubber (J), and rubber monoculture (R).

Figure 127 *Mycalesis anapita*

14. *Mycalesis anapita* (Moore, 1857)

Distribution : Sumatra, Tenasserim, Malaya, Bangka, Billiton, and Borneo.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 128. *Mycalesis janardana*

15. *Mycalesis janardana* (Moore, 1857)

Distribution : Sumatra, Malaya, Tioman, Bangka, Borneo, Java, Bali, Lombok, Panaon, Mindanao, Basilan, Celebes, Selayar, Sangir, Sula Besi, and Ternate.

Land Use : Jungle rubber (J).

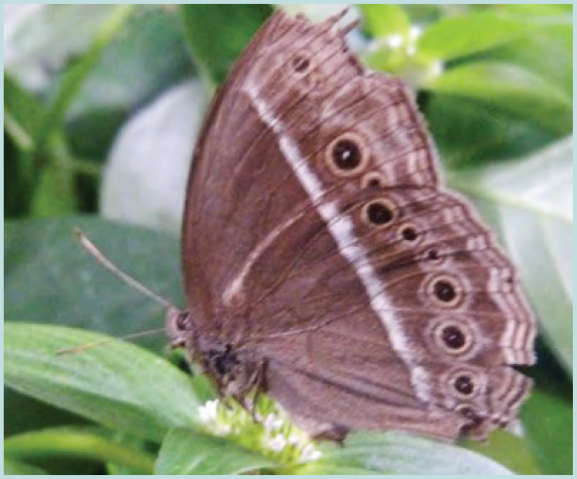

Figure 129. *Mycalesis orseis*

16. *Mycalesis orseis* (Hewitson, 1864)

Distribution : Sumatra, Burma, Malaya, Singapore, Nias, Siberut, Borneo, and Palawan.

Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 130. *Mycalesis maianeas*

17. *Mycalesis maianeas* (Hewitson, 1864)

Distribution : Sumatra, Mergui, Peninsula, Malaya, Bangka, Siberut, Sipora, and Borneo.

Land Use : Lowland rainforest (F), jungle rubber (J), and oil palm plantation (O).

Figure 131. *Mycalesis mineus*

18. *Mycalesis mineus* (Linnaeus, 1758)

Distribution : Sumatra, Kulu, Burma, Andaman, China, Formosa, Nicobar, Malaya, Singapore, the Philippines, Mindoro, Flores, Borneo, and Sumba.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 132. *Mycalesis mnasicles*

19. *Mycalesis mnasicles* (Hewitson, 1864)

Distribution : Sumatra, Burma, Siam, Tonkin, Malaya, and Borneo.

Land Use : Lowland rainforest (F).

Figure 133. *Mycalesis marginata*

20. *Mycalesis marginata* (Moore, 1881)

Distribution : Sumatra and Borneo
Land Use : Lowland rainforest (F).

Figure 134. *Mycalesis oroatis*

21. *Mycalesis oroatis* (Hewitson, 1864)

Distribution : Sumatra, Dawna, Burma, Siam, Peninsula, Malaya, Borneo, Java, and Bali.
Land Use : Jungle rubber (J) and oil palm plantation (O).

Figure 135. *Mycalesis perseus*

22. *Mycalesis perseus* (Fabricius, 1775)

Distribution : Sumatra, Sri Lanka, India, Kangra, Malaya, Andaman, Sunda, Bali, Lombok, Sumbawa, Sumba, Flores, Celebes, Moluccas, Mindanaon, Australia, Timor, Kai, and New Hebrides.
Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 136. *Mycalesis horsfieldi*

23. *Mycalesis horsfieldi* (Moore, 1880)

Distribution : Sumatra, Borneo, Tioman, Sipora, Engano, Java, Bali, and Palawan.
Land Use : Jungle rubber (J) and oil palm plantation (O).

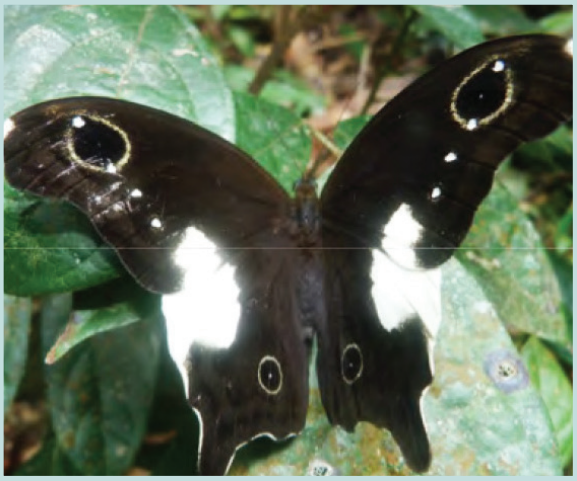

Figure 137. *Neorina lowii*

24. *Neorina lowii* (Doubleday, 1849)

Distribution : Sumatra, Peninsula, Malaya, Nias, Borneo, and Palawan.
Land Use : Lowland rainforest (F).

Figure 138. *Orsotriaena medus*

25. *Orsotriaena medus* (Fabricius, 1775)

Distribution : Sumatra, Nepal, Sikkim, Andaman, Malaya, Singapore, Tioman, Indochina, Hainan, Borneo, Java, Sunda, the Philippines, Palawan, Celebes, Peleng, Moluccas, New Guinea, Sri Lanka, India, Sipora, Darnley, Cape York, and New Britain.
Land Use : Jungle rubber (J) and oil palm plantation (O).

Figure 139. *Ragadia makuta*

26. *Ragadia makuta* (Fruhstorfer, 1911)

Distribution : Sumatra, Peninsula, Malaya, Lingga, Natuna, Borneo, Siberut, Sipora, and Java.
Land Use : Lowland rainforest (F) and jungle rubber (J).

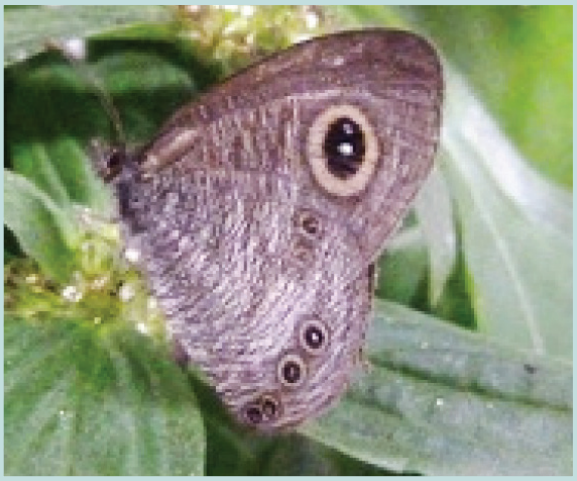

Figure 140. *Ypthima nebulosa*

27. *Ypthima nebulosa* (Aoki & Uemura, 1982)

Distribution : Sumatra
Land Use : Lowland rainforest (F), oil palm plantation (O), and rubber monoculture (R).

Figure 141. *Ypthima philomela*

28. *Ypthima philomela* (Linnaeus, 1763)

Distribution : Sumatra, India, Java, and Bali
Land Use : Lowland rainforest (F), oil palm plantation (O), and rubber monoculture (R).

Figure 142. *Ypthima horsfieldii*

29. *Ypthima horsfieldii* (Moore, 1884)

Distribution : Sumatra, Java, Bali, Bawean, and Kangean.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

D. FAMILY LYCANEIDAE

a. Subfamily Curetinae

Subfamily Curetinae which belongs to family Lycaneidae consists of two species. Below is the explanation for each species.

Family Lycaneidae consists of 5 subfamilies as follows.

a. Subfamily Curetinae

b. Subfamily Miletinae

c. Subfamily Polyommatinae

d. Subfamily Poritiinae

e. Subfamily Theclinae

Figure 143. *Curetis tagalica*

1. *Curetis tagalica* (Felder, 1862)

Distribution : Sumatra, Borneo, Malaya, Java, Bali, Nias, Palawan, the Philippines, Sulawesi, Talaud, Banggai, Sula, and Mangoli.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 144. *Curetis freda*

2. *Curetis freda* (Eliot, 1959)

Distribution : Sumatra, Borneo, and Malaya.
Land Use : Lowland rainforest (F).

b. Subfamily Miletinae

Subfamily Miletinae consists of six species. Below is the explanation for each species.

Figure 145. *Allotinus substrigosus*

1. *Allotinus substrigosus* (Moore, 1884)

Distribution : Sumatra, Borneo, Myanmar, Thailand, Malaya, Singapore, and Java.
Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 146. *Allotinus unicolor*

2. *Allotinus unicolor* (Felder & Felder, 1865)

Distribution : Sumatra, Myanmar, Thailand, Cambodia, Laos, Vietnam, Bangka, Batu, Java, Bali, Sunda, Bohol, Sulawesi, and Sula.
Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 147. *Logania marmorata*

3. *Logania marmorata* (Moore, 1884)

Distribution : Sumatra, Borneo, Cagayan, Sumbawa, Java, Bali, Malaya, the Philippines, Sulawesi, and Borneo.

Land Use : Jungle rubber (J) and oil palm plantation (O).

Figure 148. *Miletus gaetulus*

4. *Miletus gaetulus* (de Niceville, 1894)

Distribution : Sumatra, Andamans, Nicobars, Weh, Java, Kangean, Bali, Lombok, Sumbawa, Sumba, Flores, Kisser, Luzon, Sulawesi, Borneo, and Nias.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 149. *Miletus gopara*

5. *Miletus gopara* (de Niceville, 1890)

Distribution : Sumatra, Borneo, Natuna, Tawi-tawi, Tioman, and Java.

Land Use : Jungle rubber (J).

Figure 150. *Spalgis epius*

6. *Spalgis epius* (Westwood, 1851)

Distribution : Sumatra, Borneo, Sri lanka, India, Andaman, Nicobars, Sikkim, Bhutan, Indochina, Langkawi, Hainan, Taiwan, Tioman, Singapore, Nias, Java, Bali, Lombok, Sumbawa, Sumba, Damar, Palawan, the Philippines, Sulawesi, Molucca, Key, and New Guinea.

Land Use : Jungle rubber (J).

c. Subfamily Polyommatinae

Subfamily Polyommatinae consists of 17 species. Below is the explanation for each species.

Figure 151. *Acytolepis puspa*

1. *Acytolepis puspa* (Horsfield, 1828)

Distribution : Sumatra, Borneo, Afganistan, Pakistan, Andamans, Vietnam, Thailand, Japan, Langkawi, Nias, Siberut, Bali, Lombok, Sumbawa, the Philippines, Sulawesi, and Moluccas.

Land Use : Oil palm plantation (O) and rubber monoculture (R).

Figure 152. *Anthene licaenina*

2. *Anthene lycaenina* (Felder, 1868)

Distribution : Sumatra, Thailand, Malaya, Tioman, Singapore, and Borneo.

Land Use : Lowland rainforest (F).

Figure 153. *Caleta elna*

3. *Caleta elna* (Hewitson, 1876)

Distribution : Sumatra, Borneo, Malaya, Karimata, Thailand, Langkawi, Singapore, Bangka, Nias, Sikkim, and Palawan.

Land Use : Lowland rainforest (F).

Figure 154. *Discolampa ethion*

4. *Discolampa ethion* (Westwood, 1851)

Distribution : Sumatra, Borneo, Anambas, Sri Lanka, India, Myanmar, Indochina, Hainan, Siberut, Pagai, Bawean, Java, Bali, Lombok, Sumbawa, Flores, Sumba, Palawan, the Philippines, and Sulawesi.

Land Use : Rubber monoculture (R).

Figure 155. *Euchrysops cnejus*

5. *Euchrysops cnejus* (Fabricius, 1798)

Distribution : Sumatra, Borneo, Karimata, Bangladesh, Myanmar, China, Taiwan, Okinawa, Malaya, Singapore, Sulawesi, Lombok, Bali, and Flores.

Land Use : Oil palm plantation (O).

Figure 156. *Everes lacturnus*

6. *Everes lacturnus* (Godart, 1824)

Distribution : Sumatra, Borneo, Karimata, Aur, Nias, Hong Kong, Sikkim, India, Sri Lanka, Myanmar, Assam, Thailand, Okinawa, Malaya, Singpaore, Java, Bali, Sumbawa, Sumba, Flores, Timor, Banggai, Sulu, Palawan, and Philippines.

Land Use : Lowland rainforest (F) and oil palm plantation (O).

Figure 157. *Jamides alecto*

7. *Jamides alecto* (Felder, 1860)

Distribution : Sumatra, Borneo, Karimata, Aur, Nias, Hong Kong, Sikkim, India, Sri Lanka, Myanmar, Assam, Thailand, Okinawa, Malaya, Singpaore, Java, Bali, Sumbawa, Sumba, Flores, Timor, Banggai, Sulu, Palawan, and Philippines.

Land Use : Lowland rainforest (F) and oil palm plantation (O).

Figure 158. *Jamides celeno*

8. *Jamides celeno* (Cramer, 1775)

Distribution : Sumatra, Borneo, Sri Lanka, India, Myanmar, Nicobars, Thailand, Siberut, the Philippines, New Guinea, Java, Bali, Lombok, Singapore, Dammar, Flores, and Afghanistan.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 159. *Jamides talinga*

9. *Jamides talinga* (Kheil, 1884)

Distribution : Sumatra, Borneo, Thailand, Malaya, and Nias.

Land Use : Jungle rubber (J).

Figure 160. *Jamides caeruleus*

10. *Jamides caeruleus* (Druce, 1873)

Distribution : Sumatra, Borneo, Assam, Myanmar, Thailand, Malaya, and Singapore.

Land Use : Jungle rubber (J) and oil palm plantation (O).

Figure 161. *Jamides philatus*

11. *Jamides philatus* (Snellen, 1878)

Figure 161. *Jamides philatus*

Distribution : Sumatra, Borneo, Myanmar, Thailand, Singapore, Tioman, Nias, Enggano, Java, Kangean, Sumba, Palawan, the Philippines, Sulawesi, Banggai, Moluccas, and New Guinea.

Land Use : Jungle rubber (J) and oil palm plantation (O).

Figure 162. *Lycaenopsis haraldus*

12. *Lycaenopsis haraldus* (Fabricius, 1787)

Distribution : Sumatra, Borneo, Java, Vietnam, Myanmar, Malaya, Bangka, Belitung, and Thailand.

Land Use : Lowland rainforest (F).

Figure 163. *Nacaduba kurava*

13. *Nacaduba kurava* (Moore, 1857)

Distribution : Sumatra, Borneo, Thailand, Langkawai, Malaya, Tioman, Singapore, Sikkim, Sri Lanka, Bhutan, Myanmar, Hongkong, Taiwan, Hainan, Okinawa, Laos, Andamans, Bali, Lombok, Nias, Mentawai, Java, Key, Palawan, Sulawesi, Bismark, New Guinea, and Australia.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 164. *Nacaduba calauria*

14. *Nacaduba calauria* (Felder, 1860)

Distribution : Sumatra, Borneo, Thailand, Singapore, Nias, Java, Papua, Flores, and Sri Lanka.

Land Use : Jungle rubber (J) and rubber monoculture (R).

Figure 165. *Neopithecops zalmora*

15. *Neopithecops zalmora* (Butler, 1870)

Distribution : Sumatra, Borneo, India, Bangladesh, Myanmar, China, Taiwan, Hongkong, Singapore, Bali, Lombok, and Sri Lanka.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 166. *Prosotas gracilis*

16. *Prosotas gracilis* (Rober, 1886)

Distribution : Sumatra, Borneo, Java, Palawan, Nias, the Philippines, Myanmar, and Thailand.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 167. *Zizula hylax*

17. *Zizula hylax* (Fabricius, 1775)

Distribution : Sumatra, Africa, Madagascar, Sri Lanka, the Philippines, Solomons, Australia, Indochina, Taiwan, Papua, and Java.

Land Use : Oil palm plantation (O) and rubber monoculture (R).

d. Subfamily Poritiinae

Subfamily Poritiinae only consists of one species. Below is the explanation for the species.

Figure 168. *Poritia Sumatrae*

Poritia sumatrae (Felder & Felder, 1865)

Distribution : Sumatra, Malaya, Singapore, and Belitung.

Land Use : Lowland rainforest (F) and jungle rubber (J).

e. Subfamily Theclinae

Subfamily Theclinae consists of 25 species. Below is the explanation for each species.

Figure 169. *Arhopala agesias*

1. *Arhopala agesias* (Hewitson, 1862)

Distribution : Sumatra, Borneo, Singkep, Malaya, and the Philippines.

Land Use : Lowland rainforest (F), jungle rubber (J), and rubber monoculture (R).

Figure 170. *Arhopala agesilaus*

2. *Arhopala agesilaus* (Staudinger, 1889)

Distribution : Sumatra, Borneo, Palawan, Malaya, and Mindanao.

Land Use : Lowland rainforest (F), jungle rubber (J), and rubber monoculture (R).

Figure 171. *Arhopala paraganesa*

3. *Arhopala paraganesa* (de Niceville, 1882)

Distribution : Sumatra, Borneo, Java, Malaya, Sikkim, and Palawan.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 172. *Arhopala pseudocentaurus*

4. *Arhopala pseudocentaurus* (Doubleday, 1847)

Distribution : Sumatra, Borneo, Thailand, Langkawi, Singapore, Singkep, and Belitung.

Land Use : Lowland rainforest (F), jungle rubber (J), and rubber monoculture (R).

Figure 173. *Arhopala trogon*

5. *Arhopala trogon* (Distant, 1884)

Distribution : Sumatra, Borneo, Malaya, and Singapore.
Land Use : Lowland rainforest (F).

Figure 174. *Catapaecilma elegans*

6. *Catapaecilma elegans* (Druce, 1873)

Distribution : Sumatra, Borneo, Langkawi, Sri Lanka, Malaya, Nias, and Bangka.
Land Use : Lowland rainforest (F).

Figure 175. *Cheritra freja*

7. *Cheritra freja* (Fabricius, 1793)

Distribution : Sumatra, Borneo, Karimata, Sri Lanka, India, Bhutan, Mynamar, Vietnam, Laos, Thailand, Malaya, Langkawi, Singapore, Tioman, Aur, Batu, Bangka, Belitung, Java, and Bali.
Land Use : Lowland rainforest (F).

Figure 176. *Dacalana vidura*

8. *Dacalana vidura* (Horsfield, 1828)

Distribution : Sumatra, Borneo, Singapore, Bangka, and Belitung.

Land Use : Lowland rainforest (F).

Figure 177. *Deudorix epijarbas*

9. *Deudorix epijarbas* (Moore, 1858)

Distribution : Sumatra, Borneo, Sri Lanka, India, Indochina, Taiwan, Hainan, Hongkong, Langkawi, Tioman, Singapore, Andamans, Nicobars, Nias, Enggano, Bangka, Bawean, Java, Bali, Lombok, Flores, Palawan, the Philippines, and Sulawesi.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 178. *Drupadia niasica*

10. *Drupadia niasica* (Rober, 1886)

Distribution : Sumatra, Borneo, Myanmar, Langkawi, Tioman, Simeulue, Nias, Batu, Siberut, Sipora, Pagai, Philippines, and Sulu.

Land Use : Lowland rainforest (F) and jungle rubber (J).

Figure 179. *Drupadia ravindra*

11. *Drupadia ravindra* (Horsfield, 1829)

Distribution : Sumatra, Borneo, Thailand, Langkawi, Singapore, Lingga, Singkep, Natuna, Karimata, Myanmar, Thailand, Laos, Vietnam, Nias, Batu, Siberut, Sipora, Pagai, Bangka, Belitung, Java, Bali, Palawan, Luzon, Mindoro, Sulu, and Mindanao.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 180. *Eliotia jalindra*

12. *Eliotia jalindra* (Horsfield, 1829)

Distribution : Sumatra, Borneo, India, Malaya, Andamans, Singapore, Nias, Mentawai, Belitung, Java, Bali, Kangean, Palawan, Balabac, and the Philippines.

Land Use : Lowland rainforest (F).

Figure 181. *Eooxylides tharis*

13. *Eooxylides tharis* (Geyer, 1837)

Distribution : Sumatra, Borneo, Myanmar, Thailand, Malaya, Tioman, Singapore, Sumatra, Simeulue, Nias, Siberut, Sipora, Pagai, Enggano, Bangka, and Belitung.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 182. *Flos fulgida*

14. *Flos fulgida* (Hewitson, 1863)

Distribution : Sumatra, Borneo, Malaya, and Singapore.

Land Use : Jungle rubber (J).

Figure 183. *Hypolycaena merguia*

15. *Hypolycaena merguia* (Doherty, 1889)

Distribution : Sumatra, Borneo, Malaya, Myanmar, Thailand, and Java.

Land Use : Lowland rainforest (F).

Figure 184. *Iraota rochana*

16. *Iraota rochana* (Horsfield, 1829)

Distribution : Sumatra, Borneo, Singapore, Palawa, Malaya, Bangka, Java, Bali, Belitung, Sulawesi, and the Philippines.

Land Use : Jungle rubber (J) and oil palm plantation (O).

Figure 185. *Loxura atymnus*

17. *Loxura atymnus* (Cramer, 1780)

Distribution : Sumatra, Borneo, Langkawi, Singapore, Sri Lanka, India, Nepal, Myanmar, Laos, Vietnam, Hainan, Andamans, Nicobars, Java, Kangean, Bali, Lombok, Sumbawa, Flores, Kisser, Luzon, Sulawesi, and Tukangbesi.

Land Use : Lowland rainforest (F).

Figure 186. *Rapala dieneces*

18. *Rapala dieneces* (Hewitson, 1878)

Distribution : Sumatra, Borneo, India, Myanmar, Laos, Thailand, Langkawi, Malaya, Singapore, Bangka, Palawan, Sulu, and Mindanao.

Land Use : Lowland rainforest (F), jungle rubber (J), and oil palm plantation (O).

Figure 187. *Rapala domitia*

19. *Rapala domitia* (Hewitson, 1863)

Distribution : Sumatra, Borneo, Langkawi, Malaya, Singapore, Bangka, and Belitung.

Land Use : Lowland rainforest (F).

Figure 188. *Rapala rhodopis*

20. *Rapala rhodopis* (de Nicéville, 1896)

Distribution : Sumatra and Borneo.
Land Use : Lowland rainforest (F).

Figure 189. *Rapala manea*

21. *Rapala manea* (Fruhstorfer, 1940)

Distribution : Sumatra, Borneo, Karimata, Palawan, Sri Lanka, India, Pakistan, Nepal, China, Myanmar, Hongkong, Hainan, Thailand, Laos, Langkawi, Singapore, Andamans, Nias, Bawean, Java, Bali, Kangean, Lombok, Flores, Belitung, the Philippines, Sulawesi, Salayar, and Banggai.
Land Use : Lowland rainforest (F), jungle rubber (J), and oil palm plantation (O).

Figure 190. *Sithon nedymond*

22. *Sithon nedymond* (Cramer, 1782)

Distribution : Sumatra, Borneo, Myanmar, Thailand, Langkawi, Malaya, Singapore, Siberut, Sipora, Java, and Bangka.
Land Use : Jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 191. *Spindasis lohita*

23. *Spindasis lohita* (Horsfield, 1829)

Distribution : Sumatra, Borneo, Thailand, Belitung, Singapore, Langkawi, Indochina, Java, and Bali.

Land Use : Lowland rainforest (F), jungle rubber (J), and oil palm plantation (O).

Figure 192. *Surendra vivarna*

24. *Surendra vivarna* (Hewitson, 1862)

Distribution : Sumatra, Borneo, Palawan, Sri Lanka, Andamans, Myanmar, Singapore, Bangka, Nias, Java, and Sulawesi.

Land Use : Lowland rainforest (F) and rubber monoculture (R).

Figure 193. *Thamala marciana*

25. *Thamala marciana* (Hewitson, 1863)

Distribution : Sumatra, Borneo, Malaya, Singapore, Tioman, Myanmar, Laos, Thailand, Natuna, Bangka, Belitung, and Karimata.

Land Use : Lowland rainforest (F).

E. FAMILY RIODINIDAE

Subfamily Nemeobiinae

Family Riodinidae only consists of one subfamily, subfamily Nemeobiinae which has six species. Below is the explanation for each species.

Figure 194. *Abisara echerius*

1. *Abisara echerius* (Stoll, 1790)

Distribution : Sumatra, Sulawesi, Selajar, Banggai, Indochina, Thailand, Bhutan, and Luzon.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 195. *Abisara savitri*

2. *Abisara savitri* (Felder & Felder, 1860)

Distribution : Sumatra, India, Java, Manipur, Bangka, Natuna, and Borneo.

Land Use : Lowland rainforest (F).

Figure 196. *Paralaxita orphna*

3. *Paralaxita orphna* (Boisduval, 1836)

Distribution : Sumatra, Bangka, Borneo, Palawan, Burma, and Malaya.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 197. *Taxila haquinus*

4. *Taxila haquinus* (Fabricius, 1793)

Distribution : Sumatra, Burma, Thailand, Malaya, Langkawi, Singapore, Borneo, Java, Thailand, Natuna, and Palawan.

Land Use : Lowland rainforest (F), jungle rubber (J), and oil palm plantation (O).

Figure 198. *Zemeros emesoides*

5. *Zemeros emesoides* (Felder & Felder, 1860)

Distribution : Sumatra, Peninsula Malaya, Singapore, and Borneo.

Land Use : Lowland rainforest (F), jungle rubber (J), oil palm plantation (O), and rubber monoculture (R).

Figure 199. *Zemeros flegyas*

6. *Zemeros flegyas* (Cramer, 1780)

Distribution : Sumatra, Burma, Thailand, Langkawai, Lombok, Bali, Sulawesi, Borneo, Sumbawa, Nias, and Sumba.

Land Use : Rubber monoculture (R).

EPILOGUE

The presence of butterfly has an important role in the Bukit Duabelas landscape and Harapan Forest to maintain the balance of the ecosystem in the landscape. Butterfly diversity is influenced by land functions. Butterfly diversity research conducted in the Bukit Duabelas and Harapan Forest landscapes showed a significant decrease in butterfly diversity and abundance between heterogeneous forests and oil palm and rubber plantations. This proves that the change in land use from heterogeneous to homogeneous has a negative impact on butterfly diversity. The existence of forests in Sumatra needs to be maintained for the survival of the biodiversity in it. The management of oil palm and rubber plantations in Sumatra needs to be done by considering the ecological values of the surrounding nature.

This study reveals that butterfly holds various significant roles. First, the presence of butterfly in ecosystems acts as an important indicator of a healthy ecosystem and environment. Butterfly is also useful as a natural pest control and as a pollinator, as well as an important element in the food chain. Lastly, researchers also use butterfly as a model to study biological research, pest control, embryology, genetics, evolution, ecology (population dynamics), and study of habitat fragmentation. Thus, more attention needs to be put into studying butterfly in future studies.

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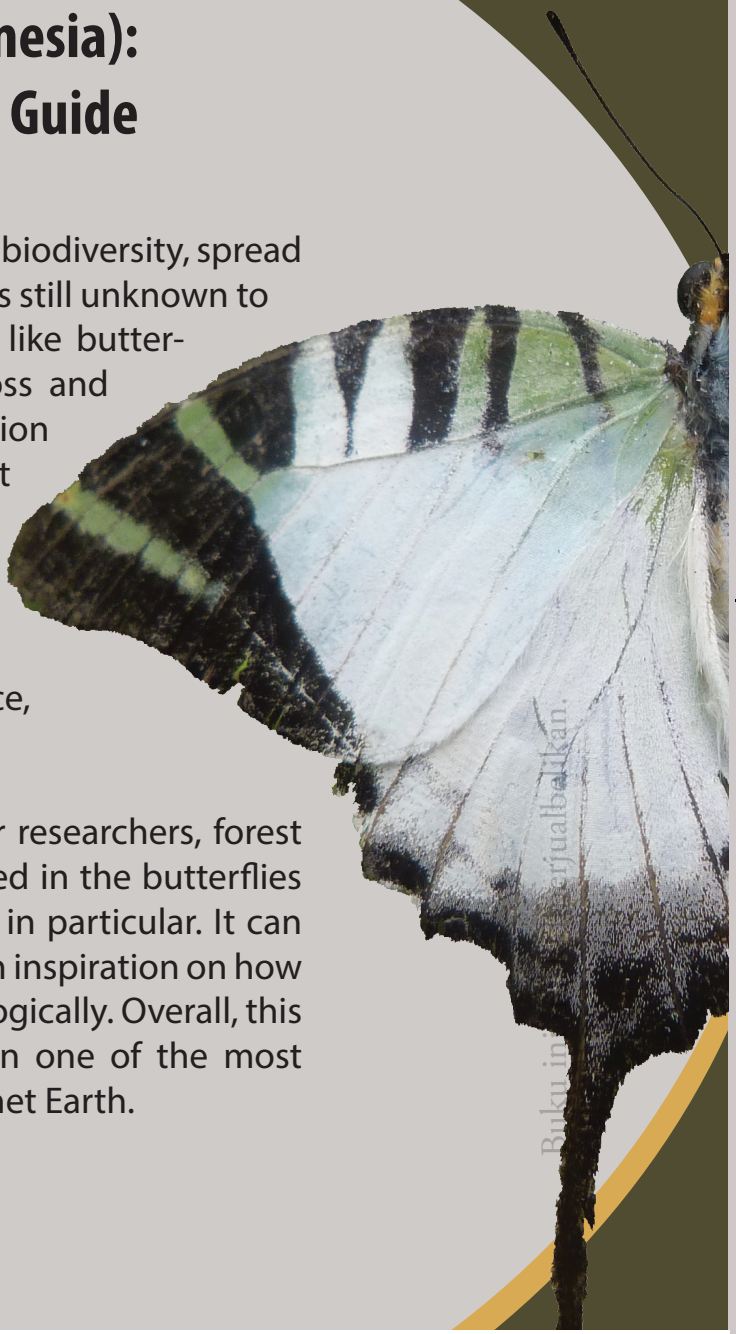
The Butterflies of Jambi (Sumatra, Indonesia): An EFForTS Field Guide

Planet Earth hosts an astonishing degree of biodiversity, spread across the globe. Much of this biodiversity is still unknown to science and remains poorly documented, like butterflies. As an insect facing rapid species loss and population declines due to habitat conversion and climate change, the need to document butterflies has become more urgent than ever. Butterflies of Jambi contains names, occurrence data and images of almost 200 butterfly species found in rainforest and three agroforest systems Jambi Province, central Sumatra.



This book is an excellent starting point for researchers, forest managers and private enthusiasts interested in the butterflies of Southeast Asia in general, and Sumatra in particular. It can also be used by students and scientists as an inspiration on how to study butterflies taxonomically and ecologically. Overall, this book offers an up-close, scientific view on one of the most attractive and extraordinary insects on planet Earth.

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