Butterflies of the Lesan River Protection Forest, Borneo

By Nanda Lestari and Roy Wiles

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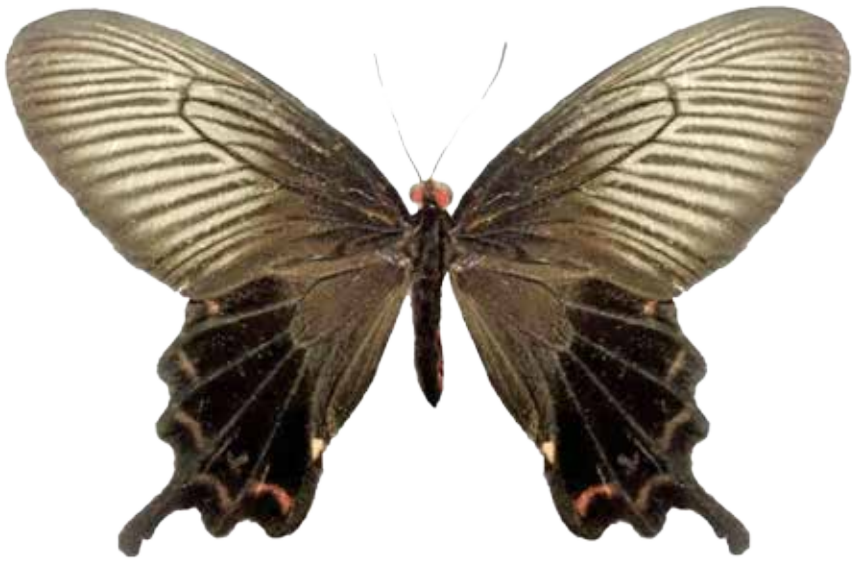

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2019

Orangutans are common in the Sungai LesanProtection forest.
Drawing A3 pencil, P. R. Wiles 2017

Acknowledgements

We are indebted to the students and staff (too numerous to list here) of the schools whose help in collecting specimens and data for this and other studies proved invaluable. A special thanks to or butterfly local guide Abet, for his enthusiasm, butterfly catching skills and bush craft. Also thanks to the staff of the Operation Wallacea Trust (Indonesia) who are working to conserve the Indonesian forests. We were impressed by their knowledge, professionalism, hard work and enthusiasm. Finally, we thank the Dayak Lesan Community who were so welcoming and who are fighting to keep their forests for future generations.

Schools List

Kattegattgymnasiet, Sweden The Primary Collegiate Academy, Taiwan Copenhagen International School, Denmark Sacred Heart College, Australia Mansfield State High School, Australia
UTC Portsmouth, UK The British School of Tokyo, Japan Kingsmead School, UK
Knights Templar School, UK

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Aims

We intend that this small publication will motivate people to visit, describe, study and appreciate rainforests for their complexity, beauty and diversity and especially, for their butterflies.

It is intended to show the amazing diversity of butterflies that were collected and identified in and around a basecamp in the Lesan River Protection rainforests of Berau, Kalimantan, Borneo as part of a biodiversity survey. We wish to promote tourism to the area and support the efforts of the Lesan Dayak community and the Operation Wallacea Trust to keep the remaining secondary lowland tropical forests, all that remains of the once mighty forests that covered the lowlands of Borneo.

2019 was a mass flowering year for the Dipterocarp trees and more than 100 butterfly species were collected and photographed (1500+ photographs) in 6 weeks in June-July by the students and staff of Operation Wallacea (Opwall.com). They represent about 10% of the butterfly species to be found in one of the most diverse areas of wildlife on Earth. This diversity is declining as the forest is destroyed, fragmented and completely removed to be replaced with farms, plantations and industry in a human landscape. Across the planet most of the lowland evergreen moist tropical rainforests have gone and with them the thousands and millions of species that were never known.

Ecological Perspectives.

Human impacts. Humans have already severely and fundamentally changed the world and now all wildlife is precious. If we were to weigh all life on earth approximately 82% would be plants, bacteria 14%, humans 0.01% and everything else 5%. Viruses weigh 3x as much as humans, and insects 17x as much; 85% of life is on land and only 1% in the sea. By weight only 4% of mammals are wild, 96% are humans and their livestock. Only 30% of birds are wild, 70% are chickens by weight (Yinonet al., 2018). In other words, humans have already severely impacted wildlife.

A Dynamic Earth. It is important to emphasise that life from the first cells 4.5 billion years ago has been ever changing in complexity, mass, and diversity. It is always changing in a changing universe. It is never unchanging. We say it is dynamic. Change is continuous from fractions of a second to vast periods of time. So, we should view life more like a living avalanche hurtling through space-time, changing in mass and diversity, tumbling and turning this way and that, never staying still. Cycles are more like 'slinkies' bouncing here and there, some fast, some slow but always changing. There is no balance of nature, populations are ever changing. We may perceive "balances", but these depend on the time frame from which they are viewed. They are always changing. The world changes continuously and wildlife with it. Nature is dynamic.

We often think that "Nature knows best" and that humans should let nature get on by itself. However, a fenced piece of rainforest fragment left to itself will decline in species diversity (Bradford and Andres, 2018). The smaller the area, the fewer the species,

and forests are fragmenting and disappearing. Humans are here and will continue to fragment forests and exploit natural resources for the foreseeable future. Left without management the remainder of the natural world will diminish still further.

Within the forest new species arise, the result of changes in environment and pressures from other organisms; others become extinct. Each generation is a bit different to the previous one. Thus, there are no truly sustainable systems and we cannot preserve things for more than a short time. What we can do is manage the change and try to direct it to include wildlife. We are the major force for change and we can see our effects on wildlife. We need to be gardening for wildlife and allowing it to prosper. Achieving this is the challenge for present and future generations.

Rainforests originated approximately 100 million years ago and were the dominant forest type at the time of the disappearance of the dinosaurs (65 million years ago). They represent the world's oldest extant biome, although current tropical forests certainly differ from the earlier ones. The forests of Borneo have joined and separated from other landmasses repeatedly down the ages, a process that generated more and more species. Areas under the sea have been repeated reforested as the sea has withdrawn to the poles with each ice age. Some areas are particularly important as places where many different species accumulate. They act as centres of dispersal. We call these diversity hotspots. The rainforests of Borneo were in a hotspot.

Butterflies were often high in the canopy. Other "mudpuddling" species aggregated on beaches of the Sungai Lesan

Unfortunately, there has been much forest clearance. First the forest giants were selectively logged, often repeatedly, to produce secondary lowland forests. However, most of the lowland forest has been removed completely for mining, agriculture and urbanisation.

In Berau there is the opportunity to save something of the old primary forests through the regeneration of significant areas of remaining secondary forest. It is thought that the remnants of the species that were in the primary forests still exist and could be managed for wildlife. It may take centuries to grow the old, now forgotten, forest giant trees but even now we can wonder at the sheer complexity, diversity and beauty of the Berau rainforests.

The Dayak LesanCommunity consists of some 1,800 people, in four villages Muara Lesan, Lesan Dayak, Merapun and Sidobangen located in Kelay district.

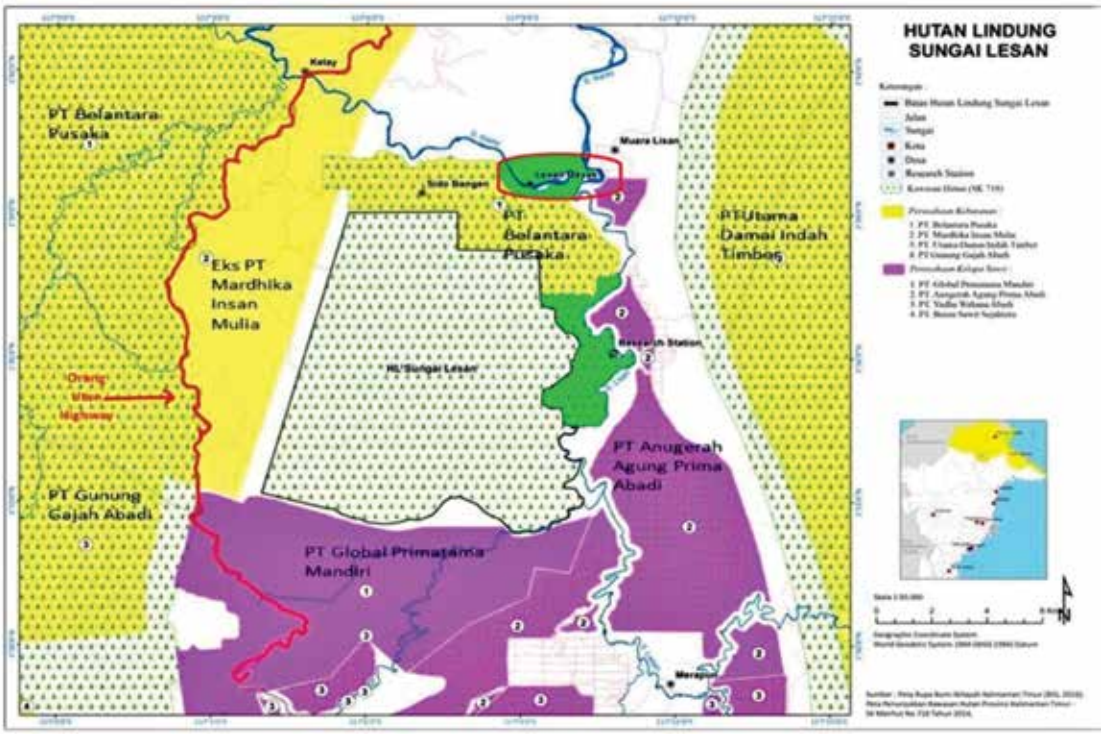
The people of Lesan Dayak are Dayak Ga'ai and proud of their cultural roots. They once lived in the forests and the oldest people in the community were born into that culture, where people thought all organisms had souls and that the forest was their protector. Traditionally, they hunted, fished, farmed and collected honey, gaharu (fragrant resin) and bird nests and so were, and still are, dependent on rainforest. Eventually, people were moved into a permanent village (Lesan Dayak) and grew crops including rubber. The community now has people of different religions which are mutually tolerated. Togetherness is highly valued.

The rainforests that were once home to the Dayak Ga'ai have been heavily exploited and cleared in the past few decades to make way for oil palm, forestry and farming. The rivers have become more silted and it has been reported that the rains are less predictable and less frequent and the temperatures higher than when the forest were intact. However, the remaining secondary forest of 13,565 ha was designated a protected area in 2014; the Sungai Lesan Protection Forest (SLPF). The local community are eager to maintain, restore and protect it.

The Sungai Lesan Protection Forest *is located in the administrative area of the Kelay District, Berau Regency, East Kalimantan Province, Borneo. It is part of the Muara Lasan forest group and covers an area of 13,565.58 ha consisting of: (1) Protected Forest Areas covering 10,240.82 ha and (2) Production Forest Areas covering an area of 3,324.76 ha (01 °32 '20.26 "-01 °40 '29.67" North Latitude and between 117 °03'58,19 "-117 °11 '13,47" East Longitude). Three villages, Sido Bangen, Lesan Dayak and Muara Lesan lie to the north and one, Kampung Merapun, is to the south.*

The Sungai LesanProtection Forest (Operation Wallacea Trust 2018).

Note: the north/south "Orang Utan Highway" to the left and the green areas around Base Camp and Lesan Dayak village where butterflies were surveyed. Purple areas are oil Palm Plantations and yellow areas production forest. The area between the orangutan highway and the Sungai Lesan forest in plain yellow is designated for oil palm plantations. This would be a disaster, leaving the reserve as an isolated forest island.



Elsewhere the area is surrounded by oil palm and forestry company concessions. However, to the east, the Wehea forest is currently linked across the north / south "Orang utan highway", Jl. Berau-Samarinda (the Tanjung Redeb-Samarinda road), through an oil palm concession that has not yet been cleared and planted. To the west across a narrow neck of oil palm plantation it links to further forest, across limestone country and on to the coast near Talok. If a plan to manage this larger area for wildlife were to be developed with people, tourism and industry collaborating in a shared vision for Berau that includes their wildlife, it is possible that these forests may be big enough to survive and regenerate into the future.

The (SLPF) forest in the study area is a secondary and old secondary lowland tropical rainforest. It receives variable rainfall between years: 1871mm / year (2018) and 2080mm (2016) with a variable wetter period around January and a drier period in July/ August. Soils are generally acid with a low fertility. Forests are dominated by Dipterocarp trees and has a high diversity of fruit trees which supports over 52 mammal, 118 bird, 31 amphibian and 31 reptile species including the iconic (but declining) orang utan (2011 figures). However, systematic collections of invertebrates including butterflies are yet to be carried out in this area. For further information contact the Operation Wallacea Trust, Indonesia.

Butterflies and species diversity measurements. Butterflies are one of the best-known groups of insects. Most species, approximately 20,000, have been described but new species are still being discovered at an annual rate of 100-300 species worldwide. Operation Wallacea found a new species of swallowtail on Fiji in 2017. Given their visibility and diversity, it is not surprising that butterflies are used to monitor change. Many are easily identified on the wing and in temperate regions they have been

successfully used in wildlife management. However, there are considerable problems in tropical rainforests for Lepidopterists to address before they can be a useful management tool.

Diversity is a measure of number of species (species richness) and abundance (number of individuals). Knowing what makes a species is therefore critical. Generally, we think of groups of organisms that are reproductively isolated. However, this is not established commonly when describing new species and we use morphology (the structure of the body) as a measure of breeding isolation. In butterflies wing pattern is the most conspicuous morphological feature used but taxonomists also use genitalia, antennae and other body parts to separate species. More recently differences in the structure of DNA are used. If groups look different then this probably reflects a difference in the way they live their lives and therefore indicates breeding isolation.

However, many butterfly species have variable wing patterns (polytypic) and some species are so similar that they can only be separated on small differences in the structure of their genitalia or their DNA. Species may have variant populations in different parts of their range. On different islands and in different geographical regions wing patterns of a species are slightly different. These variants are often called subspecies. Changing subspecies to species can make significant changes to species diversity estimates. Similarly, butterflies at different geographical locations have been named as different species when they are really one widely dispersed species. It is not uncommon for there to be 20 subspecies of a widely distributed species, each named from different geographical locations.

There are other reasons why wing patterns vary within a species. Mimicry, where an edible species evolves similar wing patterns to those of distasteful species, is complex. It may involve many species or one species may mimic different distasteful species depending on location and timing. Many unrelated species may evolve a common warning pattern.

Some species have seasonal forms. This makes it difficult to identify butterflies without a good knowledge of variation, a keen eye, good photographs and for most species it probably requires capture. Even then, with specimens pinned and photographed, it may not be possible to reliably identify a species (e.g. Oakbluebutterflies of the genus *Arhopala*) without an examination of the shapes of genital appendages or DNA. There is a huge lack of knowledge about butterflies. In the tropics there are large numbers of rare species compared to common species. These turn up infrequently and so can affect our species abundance estimates.

Then there is the problem of observation in the field. Many species live high in the canopy and are not seen. In some species males are seen to come to the forest floor looking for salt, but females stay in the canopy. Therefore, it is difficult to estimate abundance (the number or relative number of individuals of a species) in lowland tropical rainforests.

Finally, we have the problem of interpretation of the data we might collect. Due to our sparse knowledge of butterfly ecology in tropical rainforests, we cannot put a meaning to changes we observe. We barely have more than a name tag for most species and we have no idea what they do for a living, their food, interactions with other species, parasites and predators or how they deal with their environment, how they respond to change and for whom they are important.

Given these difficulties means that the utmost care is needed when designing and setting the limits of butterfly surveys. They are useful as part of a general survey programme to indicate species richness but their use as a tool to monitor change is in its early stages.

Rajah Brooke butterfly is an iconic species found in the Sungai LesanProtection forest. It is a protected species and a challenge to photograph.

Methods of collection and photography. Butterflies were mostly collected with butterfly nets on forest walks and by boat locally along the LesanRiver. Examples of each species were taken for pinning and photography.

Butterfly traps baited with fruit or fish were emptied daily and the species present noted. Examples of each species were taken for pinning, the rest were freed after examination.

We also photographed wherever possible living butterflies. A most difficult exercise that met with limited success.

Living butterflies for the collection were put into waxed paper bags. Back at base camp they were placed in a killing-jar and killed with ethyl acetate vapour in the traditional way. A killing-jar is lined with plaster of Paris and liquid ethyl acetate is added. The specimens, still in their paper bags, are then placed in the jar and pinned out the following morning. Sometimes they were kept for longer but were still pliable enough

for pinning out onto polystyrene pinning boards. Pinned specimens were labelled with a unique code e.g. C21 and the boards kept in sealed boxes with silica gel to dry specimens. In addition, they were partially dried at basecamp in the sunshine but the humidity meant that they never dried sufficiently for the permanent collection.

When dry enough to take photographs, the specimens were taken from the pinning boards and the dorsal and ventral views photographed under natural light. They were then placed in sealed boxes with silica gel for a collection for the Lesan Dayak community and the Operation Wallacea Trust (Indonesia). Photographs were used to identify the butterflies during the following months and processed using PowerPoint. The background was removed, and the identified species made into plates for this book.

Butterflies.

Butterflies (Lepidoptera) evolved some 200 million years ago. They share a common ancestor with Caddis Flies (Trichoptera) and have several features in common with them. They are both different from all other insects in that females have dissimilar sex chromosomes. They differ in that Trichoptera have hairy wings and Lepidoptera have scales on their wings. Scales can be rubbed off to reveal a clear membranous wing.

Clearwing butterflies lack scales on the clear regions of their wings. Wings are made of a double membrane supported by supported by a network of veins that radiate from the wing base. The pattern of veins is a feature that can be used to classify butterflies.

The most obvious feature used to identify butterflies are the wing patterns. The colourful patterns are the result of two alternating scale types that cover the wing membrane like roof tiles. Pigmentary scales have pigments and structural scales diffract light to make the rainbow iridescent colours as the butterfly moves its wings.

Some scales have sacs at the base which contain sex pheromones. These are the androconia. These scales may be arranged in patches to form sex brands or in pockets. They may be on the forewing or hindwing such that when wings are moved a pheromone trail is wafted into the air to attract a mate.

The wing patterns of butterflies are used to avoid predators and attract mates. The patterns may mimic plants that they settle on or break up their outline or they may be transparent to avoid visual predators. Some may have patterns that scare predators such as eyespots that they flash when they open their wings. Others use eyespots to misdirect predators, especially birds into pecking at the wing rather than the head which would be fatal. Many of our specimens showed damage due to bird attack.

Wing patterns may also advertise their unpalatability to birds. Yellow and black stripes or red and black conspicuous colours are recognised by birds that learn when they find a butterfly distasteful not to attack another one. Distasteful butterflies therefore survive bird attacks as most are not attacked. However, some species that are edible mimic the patterns of distasteful species. This is Batesian mimicry and was discovered in Amazonia by Henry Bates in the 1850's. Some butterflies often distantly or unrelated, that are all distasteful, may come to mimic each other with the same wing patterns. These are Mullerian mimics and they can form mimicry rings of multiple species. It is therefore very difficult to tell these species apart.

Butterflies and moths

Lepidoptera includes moths and butterflies. The distinction between the groups is however blurred in that there are moth like butterflies and butterfly like moths. Generally butterflies have club shaped tips to their antennae. Butterflies are in two suborders: Hesperioidea and Papilionoidea. There is one family in the Hesperioidea and six in the Papillionoidea. The species collected have been arranged in order of families and thereafter in alphabetical order. For a more detailed account of butterflies I recommend the works of Adrian Hoskins F.R.E.S. given in the references section.

Bright hindwing colours of a moth in our butterfly trap.

Superfamily Hesperioidea

Family Hesperiidae

Family Hesperiidae
Subfamily: Hesperiinae
Group Ancistroides

1. *Koruthaialos sindu* (C. & R. Felder, 1860)
Bright Red Velvet Bob

Specimens: C193
WL: 17 mm
Distribution: India to Indonesia.

Notes: Caught around base camp. Took up salts from drying clothes. In secondary Lowland rainforest. Life cycle partially known.

1

Family Hesperiidae
Subfamily: Hesperiinae
Group

1. *Hasora taminatus* (Hübner, 1818)?

Specimens: C214
WL: (not recorded)
Distribution: India to Indonesia. The subspecies reported for Borneo is the widespread ***H. t. malayana*** (C. & R. Felder, 1860). However, our specimen has a pale diffuse area on the under forewing. It is very similar to ***H. vitta*** and ***H. chromis****.*

Notes: Caught around base camp. Took up salts from drying clothes. In secondary Lowland rainforest.

2. *Hasora badra* (Moore, 1858)?
Common Awl

Specimens: C189
WL: mm
Distribution:

Notes: Caught around base camp. In secondary lowland rainforest. Life cycle known.

3. *Isma iapis iapis* (de Nicéville, 1890) ?
Plain Tufted Lancer

Specimens: C190
WL 22 mm
Distribution: Burma to Borneo. Several similar species and the above designation is not confirmed.

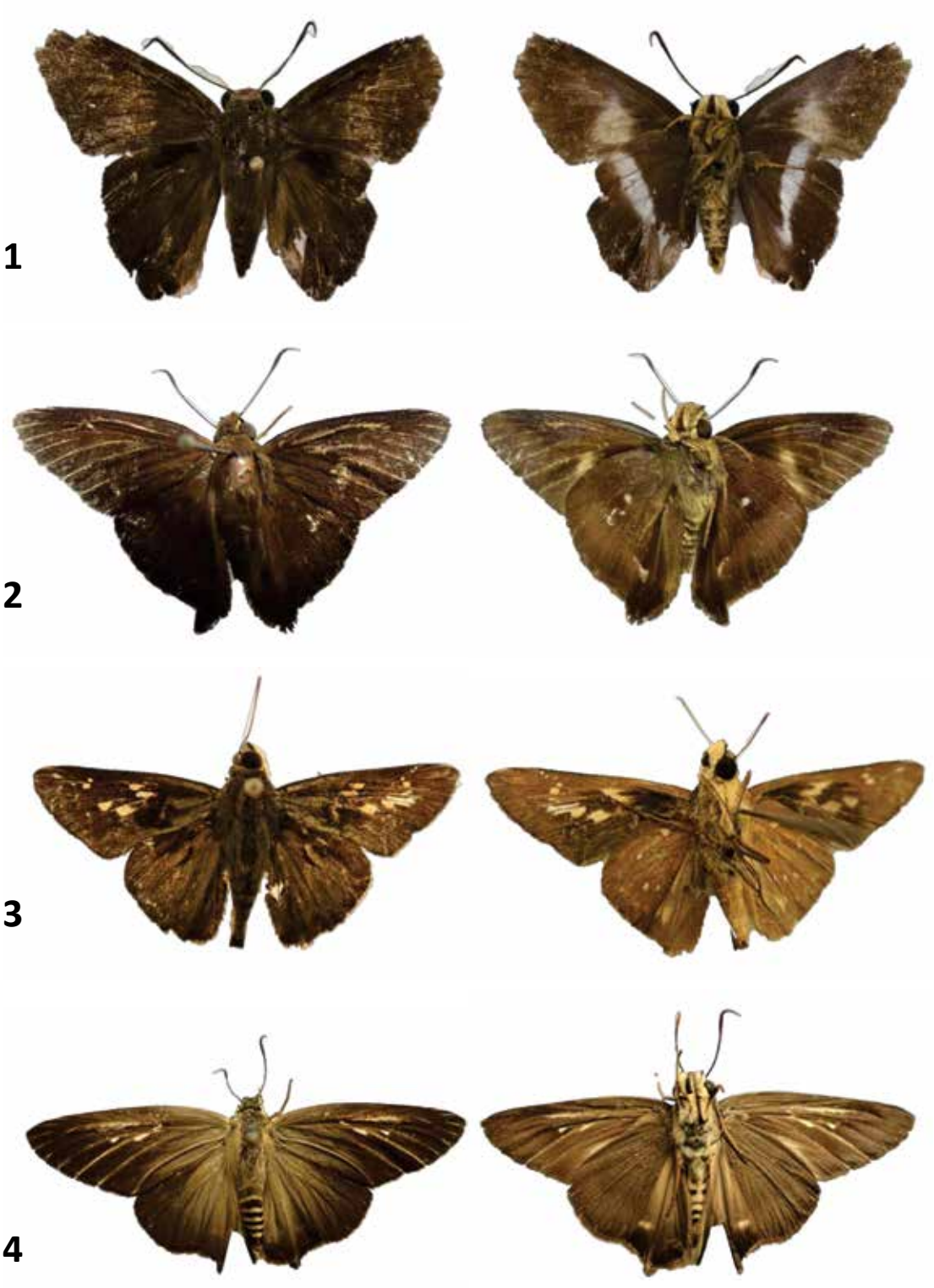
Notes: Caught around base camp in secondary Lowland rainforest.

4 ?

Specimens: C92
WL: 30 mm
Distribution:

Notes:

Family Hesperiidae
Subfamily: Hesperiinae
Group



Superfamily Papioionoidea

Family Papilionidae

Papilio (Menelaides) memnon (Linnaeus, 1758)

Great Mormon

Mixed group of nine species of mudpuddlerson the Sungai Lesan riverbank

Papilionaceae mudpuddling on the Sungai Lesan riverbank

Family Papilionidae
Subfamily: Papilioninae
Tribe: Troidini

1. *Trogonoptera brookiana* (Wallace, 1885)
Rajah Brooke's birdwing

Specimens: photographs only.
WL: reported 75-85 mm
Distribution: Peninsular Malaysia Sumatra and Borneo

Notes: Protected species. Found by us in secondary lowland rainforest along margins forest margins and riverbanks. Mudpuddling behaviour common along river margins. Males common, females remain in the canopy. Photographs show the dorsum and venter of a male and detail of the genital opening.

In May 2009 at Ulu GerokI came across one of the most stunning butterfly spectacles I have ever seen -a massive group of over 100 pristine Rajah Brooke's Birdwings settled on a small patch of ground on a quiet forest track. No photograph, video clip or words can begin to do justice to the incredible beauty of these creatures, and to see such a huge aggregation was a sight guaranteed to blow the mind of the most experienced butterfly enthusiast.

Try to imagine 100 butterflies, each measuring over 17cms, 7 inches across, a quivering mass of shimmering iridescent green wings, packed together on a patch of ground the size of a small dining table. Then try to imagine the thrill of being so close that you could reach down and touch them. After taking a few photographs you edge gently away but the whole group erupts into flight, and you are surrounded by a swirling mass of glittering green wings. You freeze on the spot, hoping not to scare them away, and they respond by gliding closely around you. Then one by one they resettle on the ground until they encircle you. At first they nervously quiver and flutter, but after a couple of minutes they all relax and spread their glorious wings. You are mesmerised, and the huge privilege of such an experience is something you never forget.

Adrian Hoskins

http://learnaboutbutterflies.com/About%20the%20author2.htm

Family Papilionidae
Subfamily: Papilioninae
Tribe: Troidini

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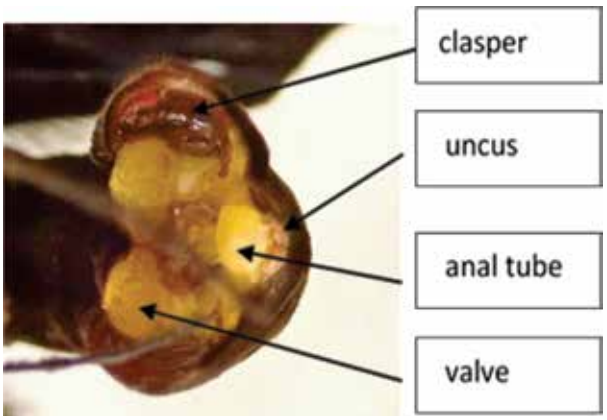

Family Papilionidae
Subfamily: Papilioninae
Tribe: Papilionini

1. *Pachliopta antiphus* (Fabricius)
Borneo Black Rose

Specimens : C130
WL: 70 mm
Distribution: India to Indonesia.

Notes: ***Pachliopta antiphus antiphus*** (Fabricius, 1793) is reported from Borneo. Observed in lowland secondary forests and along river margins. Life cycle well known.

2. *Papilio helenus* (Linneus, 1758)
Red Helen

Specimens: C53, C209
WL: 57 mm
Distribution: India, Japan to Indonesia and Australia.

Notes: Many subspecies. The Borneo subspecies is ***Papilio helenus enganius*** (Doherty, 1891).

Seen along river margins in secondary lowland forest and in mixed species flocks "mud puddling". Life cycle known and caterpillars feed on a wide variety of plants especially Rutaceae

3. *Papilio nephalus* (Boisduval, 1836)
Black and White Helen

Specimens: C54, C201
WL: 55 mm
Distribution: India, China to Indonesia.

Notes: Many subspecies*.* ***P. n. albolineatus*** (Forbes, 1885) is reported from Borneo. Observed in lowland secondary forests and along river margins.

Family Papilionidae
Subfamily: Papilioninae
Tribe: Papilionini

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3

Family Papilionidae
Subfamily: Papilioninae
Tribe: Papilionini

1. *Papilio polytes* (Linnaeus, 1758)
Common Mormon

Specimens : C131
WL: 45 mm
Distribution: Malaysia to Indonesia.

Notes: *P . p. theseus* (Cramer, 1777) is the subspecies from Borneo. Sexually dimorphic species.Polymorphic females are classic Batesian mimics of unpalatable species.

2. *Papilio* (Menelaides) **memnon** (Linnaeus, 1758)
Great Mormon

Specimens: C39
WL: 70 mm
Distribution: India, Japan to Indonesia.

Notes: Many subspecies. ***P. (M.) m. memnon*** (Linnaeus, 1758) is reported from Borneo. Observed in lowland secondary forests and along river margins.

3. *Papilio demoleus* (Linnaeus, 1758)
Lime/Lemon/chequered Swallowtail

Specimens: C129
WL: 49 mm
Distribution: Global tropics: Cuba, West Indies, Arabia, to China to Australia.

Notes: Pest species of cultivated Limes and Citrus species. Invasive species having invaded Borneo to become one of the more common species of butterfly. Found in cultivated landscapes, savannahs and secondary forests. Mud-puddlerfound along river margins on gravel shoals. It is reported to feed on blue and purple flowers.

Family Papilionidae
Subfamily: Papilioninae
Tribe: Papilionini

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3

Family Papilionidae
Subfamily: Papilioninae
Tribe: Leptocircini

1. *Graphium sarpedon* (Linneus, 1758)
Common Bluebottle

Specimens: C17, C141, C207
WL: 48 mm
Distribution: India, China to Indonesia and Australia.

Notes: Many subspecies. Seen along river margins in secondary lowland forest and in mixed species flocks "mud puddling". Observed feeding on rotting fruit. They were never more than 10% of the individuals in a mixed species group. Wings always quivering and vibrating when imbibing liquids. Known to migrate. Life cycle known and caterpillars feed on a wide variety of trees.

2. *Graphium doson* (C. & R. Felder, 1864)
Common Jay

Specimens: C61, C144, C168, C235
WL: 42 mm
Distribution: India, China to Indonesia.

Notes: At least 12 subspecies of which ***G.d.evemonides*** (Honrath, 1884) is reported from Borneo.

Seen along river margins and in mixed species flocks "mud puddling" where they were the majority of individuals in mixed species groups. Wings always quivering when imbibing liquids.

3. *Graphium bathycles bathycloides* (Honrath, 1884)
Striped Jay

Specimens: C202
WL: 44 mm
Distribution: Widely reported from Thailand, the Philippines and Borneo.

Notes: The taxonomy of *Graphium*is not yet fixed and species recognised may be subject to change. ***G. chironides*** (Honrath, 1884), the Veined Jay, is one such species. It was considered to be a subspecies of ***G. bathycles*** (Zincken, 1831) and especially close to ***G. b. bathycloides*** (Honrath, 1884) such that according to Wilson et al 2014, it is not possible to unambiguously to separate them on morphology and comparing DNA indicated a close relationship. Our specimens are very similar to those from Brunei identified as ***G. b. bathycloides***.

Family Papilionidae
Subfamily: Papilioninae
Tribe: Leptocircini

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Family Papilionidae
Subfamily: Papilioninae
Tribe: Leptocircini

1. *Graphium antiphates* (Cramer, 1775)
Five-bar Swordtail

Specimens: C199, C200
WL: 36 mm
Distribution: India, Indonesia and Australia.

Notes: Males and females are similar. Several subspecies of which 3 are reported from Borneo: ***G. antiphatesitamputi, G. a. simpulensisand A. a. sinambungensis***. Seen along river margins and in mixed species flocks "mud puddling" or alone along riverbanks in secondary lowland forest areas. Life cycle known and caterpillars reported to feed on a wide variety of plants. Adults, like other ***Graphium*** species, suck up salt rich water, absorb dissolved minerals and pump fluid from the anus so it can be re-imbibed again.

2. *Graphium agamemnon* (Linneus, 1758)
Tailed Jay / green spotted triangle

Specimens: C15, C184, C196
WL: 46 mm
Distribution: India to Australia.

Notes: Many subspecies. Seen along river margins and in mixed species flocks "mud puddling" . Males were observed flying fast along the margins of secondary lowland forests, often chasing another individual.

Family Papilionidae
Subfamily: Papilioninae
Tribe: Leptocircini

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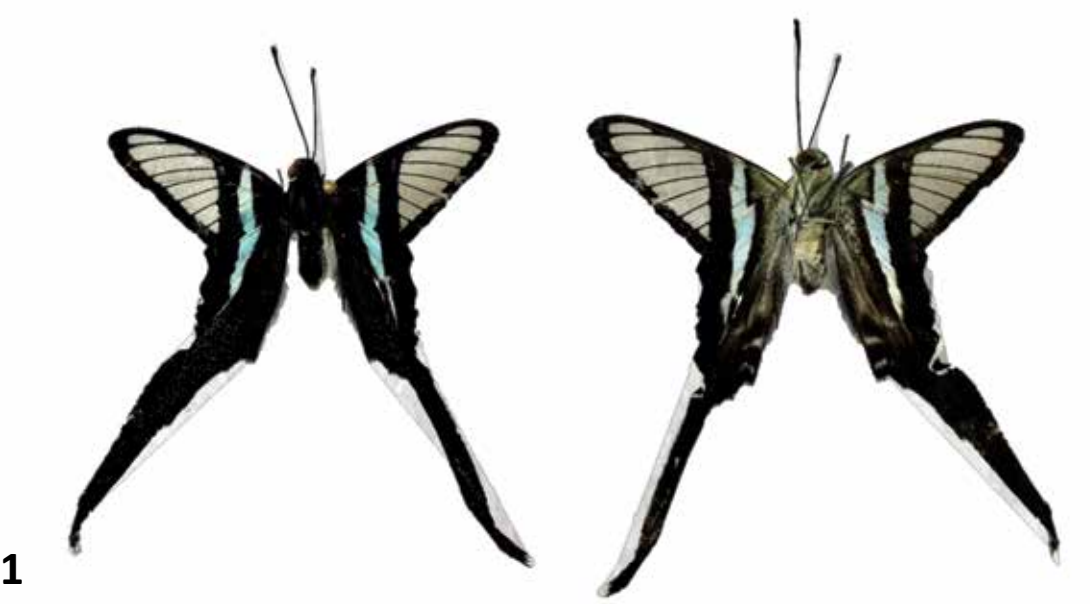
Family Papilionidae
Subfamily: Papilioninae
Tribe: Leptocircini

1. *Lamproptera meges* (Zinken-Sommer, 1831)
Green Dragontail

Specimens: C232
WL: reported 20 mm
Distribution: India, Indonesia.

Notes: Found along riverbanks of secondary lowland rainforest. Mudpuddling species. Life cycle known and larvae feed on Rutaceae.



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Superfamily Papilionoidea

Family Pieridae

Deliasbaracasa (Semper, 1890)

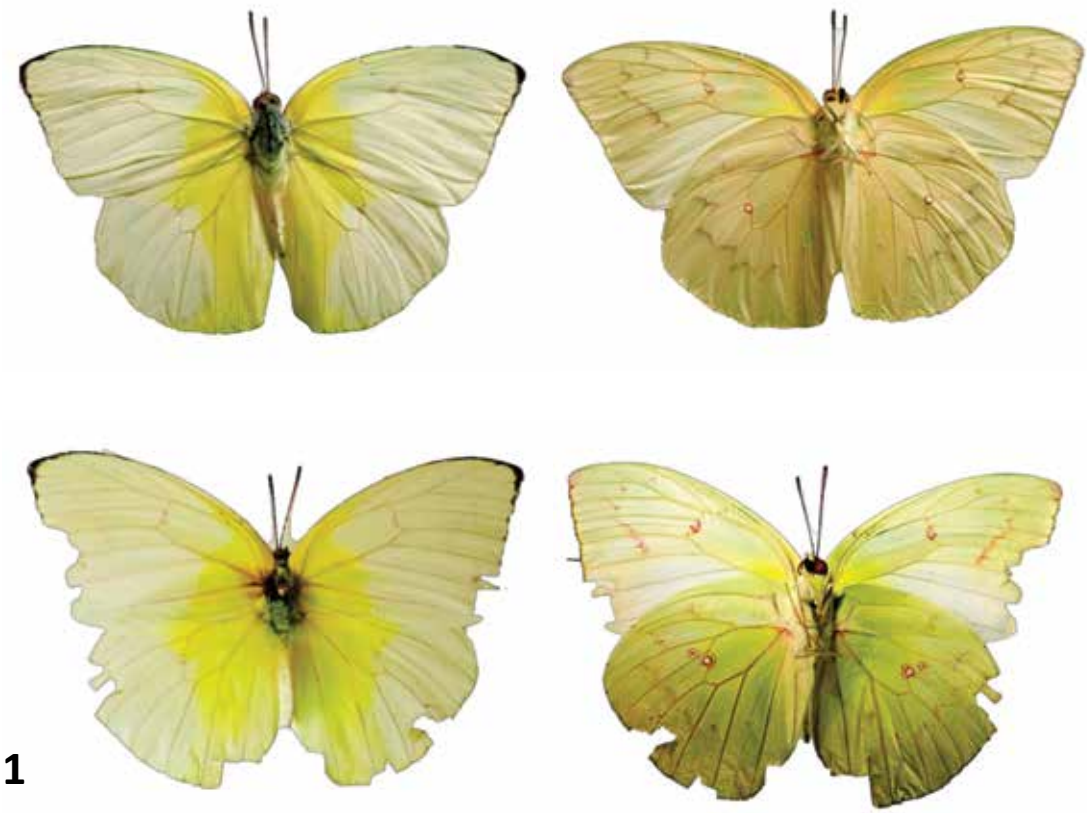
Common Yellow Jezabel

Family Pieridae
Subfamily: Coliadinae

1. *Catopsilia pomona* (Fabricius, 1775)
Lemon Emigrant

Specimens: C40, C94, C120
WL: 41-42 mm
Distribution: The type species is widely distributed between India to Australia and Madagascar. Colour forms vary depending on photoperiod and temperature during growth. Our specimens are *pomona forms* which have spots on the underside of the wings. The form *cerocale* lacks rings. ***C. pomona*** is known to migrate, and the life cycle has been recorded. Commonly observed around the margins of secondary forest, in Kampongs and along roadsides.

Family Pieridae
Subfamily: Coliadinae



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Family Pieridae
Subfamily: Coliadinae

1. *Eurema nicevillei nicevillei* (Butler, 1898)
Banded Grass Yellow

Specimens: C227
WL: (reported 19-23 mm)
Distribution: Thailand, Malaysia, Sumatra and Borneo.

Notes: The yellow veins across the black margin of the upper forewing are diagnostic for the species. Collected in secondary lowland tropical rainforest.

2. *Eurema hecabehecabe* (Linnaeus, 1758)
Common Grass Yellow

Specimens: C1, C22, C32a, C46, C109, C110
WL: 23-27 mm
Distribution: Africa, Asia and Australia.

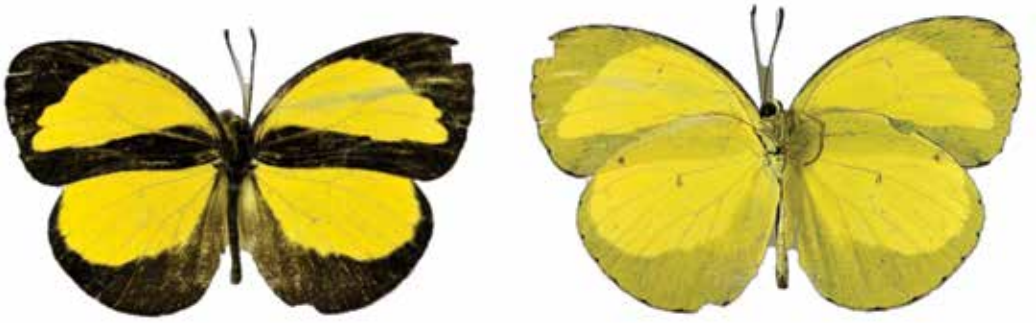
Notes: Widely distributed pest species of ***Acacia*** plantations. Mud puddler observed along riverbanks congregating with other species. Very common.

3. *Eurema simulatrix tecmessa* (de Nicéville& Martin,1896)
Changeable Grass Yellow / de Nicéville'sgrass yellow

Specimens: C32
WL: 24 mm
Distribution: Burma to Borneo.

Notes: Mud puddler observed along riverbanks congregating with other species. Less common than ***E.hecabe*** and found around base camp at the edge of secondary lowland rainforest. Life cycle needs reviewing.

1



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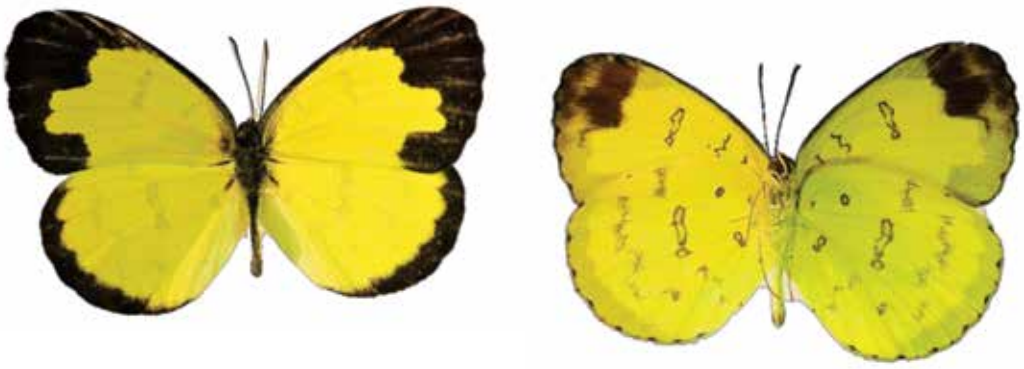


Family Pieridae
Subfamily: Pierinae

1. *Gandaca harina* (Horsefield, 1829)
Tree Yellow

Specimens: C158
WL: 24 mm
Distribution: India to New Guinea.

Notes: Holotype described from Java with several subspecies in other geographical locations. ***Gandaca harina distanti*** (Fruhstorfer, 1910), commonly found on Peninsular Malaysia, is probably the Bornean subspecies. Reported from inland forests and wet areas.

Our specimen was at the margins of secondary lowland rainforest.

2. *Leptosia nina* (Fabricius, 1793)
Psyche

Specimens: C219, C222

WL: reported 20 mm with wide size variation. Wingspan 25-53 mm.

Distribution: India, China to Australia.

Notes: ***L. n. malayana*** (Fruhstorfer, 1910), is the Bornean subspecies. Reported common in human landscapes and secondary forest clearings and roads.
Our specimen was at the margins of secondary lowland rainforest. ***Capparis zeylanica*** is a reported foodplant, a widely distributed climbing shrub.

Family Pieridae
Subfamily: Pierinae
Tribe Pierini

1

2

Family Pieridae
Subfamily: Pierinae
Tribe: Pierini

1. *Appias nero* (Fabricius, 1793)
Orange Albatross

Specimens: C95
WL: 39 mm
Distribution: The type species is widely distributed between India and Indonesia, the subgenus from Malaysia to Australia.

Notes: There more than 15 subspecies recorded for this geographically variable species. The subgenus is distributed from Malaysia to Australia. The subspecies reported for Borneo is ***A. n. chelidon*** (Fruhsorfer, 1905) (Brower et al 2010).

We encountered males mud-puddling along secondary lowland rainforest river shoals. Females are reported to be more common at higher elevations above 500 m and fly in the forest canopy.

2. *Cepora judith* (Fabricius, 1787)
Orange Gull

Specimens: C72 , C171
WL: 34 mm
Distribution: The type species is widely distributed between Burma and Indonesia and some 30 subspecies are described.***C. j. montana*** (Fruhstorfer, 1899) is found in Northern Borneo and ***C. j. meridionalis*** (Fruhstorfer, 1899) in S.E. Borneo.

3. *Delias baracasa* (Semper, 1890)
Common Yellow Jezabel

Specimens: C142
WL: 39 mm
Distribution: The type species is widely adistributedbetween Malaysia, the Philippines and Indonesia. There are 6 subspecies reported.***D. b. cathara*** (Grose-Smith, 1893) is found in Borneo.

Family Pieridae
Subfamily: Pierinae
Tribe Pierini
Subtribe Appiadina
Genus Appias
Subgenus Catophage
Group Glabra

1

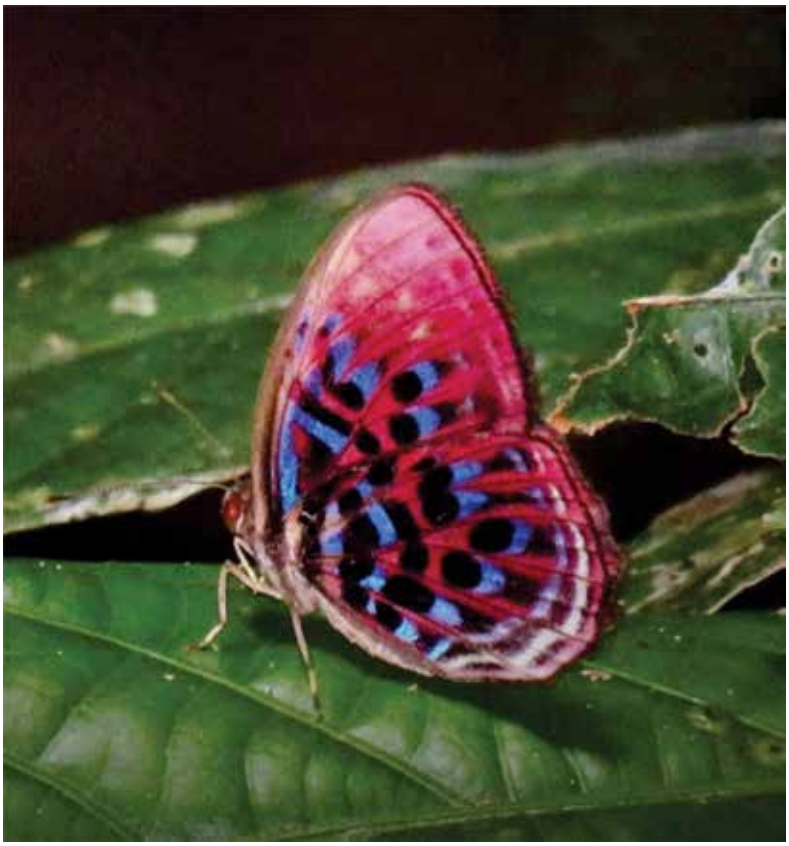
Family Pieridae
Subfamily: Pierinae
Tribe Pierini

2

3

Superfamily Papilionoidea

Family Riodinidae



Paralaxita telesia (Hewitson, 1861)

Red Harlequin

1. *Zemeros emesoides C. & R*. (Felder, 1860)
Malayan Punchinello

Specimens: photo only
WL: (not measured)
Distribution: Malaysia to Indonesia.

Notes: ***Zemeros emesoides*** *eso* (Fruhstorfer, 1904) is the subspecies on Borneo. We only got a photograph of this species taken at a distance.

1

2. *Paralaxita telesia* (Hewitson, 1861)
Red Harlequin

Specimens: C9, C226
WL: 24 mm
Distribution: Thailand to Indonesia.

Notes: ***P. t. pistyrus*** (Fruhstorfer, 1914) is reported from Borneo. Observed in lowland secondary forests and along river margins. Life cycle well known.

2

Superfamily Papilionoidea

Family Lycaenidae

***Amblypoda* sp. ?**

Introduction

Lycaenidae are particularly diverse in Indomalayan tropical forests. More than 118 species of Lycaenidae have been reported from Borneo. Generally called blues they are often difficult to identify from wing patterns. Often species are distinguished by their genitalia and more recently from DNA.

We have identified those we can from wing patterns by comparing them with published images. The work of Yasua Seki et al 1991 (Butterflies of Borneo volume 2) has been most useful. We have also referred to various papers in the scientific literature and accredited websites given in the references. Where we are uncertain of our species designation we have added a ?. If we cannot identify a butterfly we simply call it sp., and if we can see a difference with another species we label it A,B C etc..

The highest percentage of Lycaenidaeare in the canopy butterfly fauna. This makes survey work particularly difficult. They, like most butterflies, need a good deal of research to find even basic information. If we have made mistakes please send us a correction. This booklet is to encourage tourism but it is clear that comprehensive expert revision is needed and a reference book produced based on good scientific research.

Family: Lycaenidae
Subfamily: Curetinae

1. *Curetis sperthis sperthis* (C. & R. Felder, 1865)

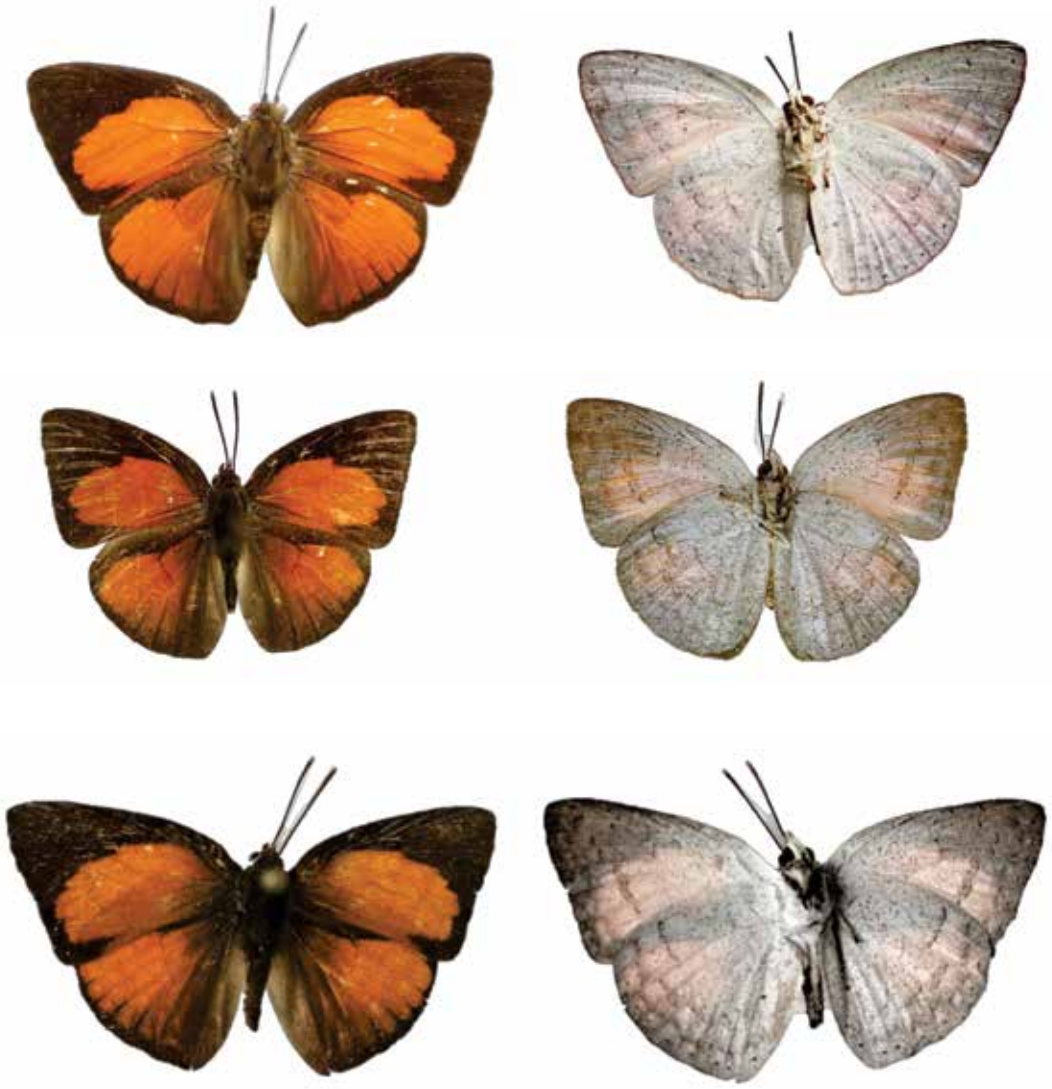
Specimens: C40a, C63, C70, C105, C215
WL: 19-21 mm
Distribution: Malaysia, Borneo.

Notes: Ressembles superficially to ***C. santana*** and can be differentiated by its post-discalband which is almost parallel to the forewing outer margin (termen) while in ***C. santana*** it is much more angled towards the outer margin of the forewing (oblique). This is difficult to see. Undersides powdered with black dots like in ***C. santana***. On the upperside, the male hindwing costa is black.

Common species in secondary lowland rainforest. Attracted to fruit and fish and seen on river beaches mudpuddling.

2. *Curetis santana malayica* (C & R Felder, 1865)?
Malayan Sunbeam

Specimens: C64
WL: 19 mm
Distribution: Burma to Indonesia. Similar to ***C sperthis sperthis*** (see above.). Also there appear to be red spots on the palps whereas ***C.s.sperthis*** has white palps.



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Family Lycaenidae
Subfamily Miletinae
Tribe Miletini

1. *Allotinus (Paragerydus) leogoron normani* (Eliot, 1967)

Specimens: C11 , ♀ C183, C68
WL: 16 mm
Distribution: Thailand to Sumatra and Borneo.
Allotinus leogoron normani Eliot, 1967 (Brunei, Borneo) fits most closely. It is similar to the variable ***Allotinus unicolor unicolor*** C. & R. Felder, 1865 of which two of the 8 subspecies occur in Borneo. ***A. U. Unicolor*** is widespread. ***A. u. moorei*** (H. H. Druce, 1895) is reported from Mt. Kinabalu, Sabah. The butterfly was earlier known and is still sometimes classified by some authorities as ***Allotinus horsfieldii*** Moore.

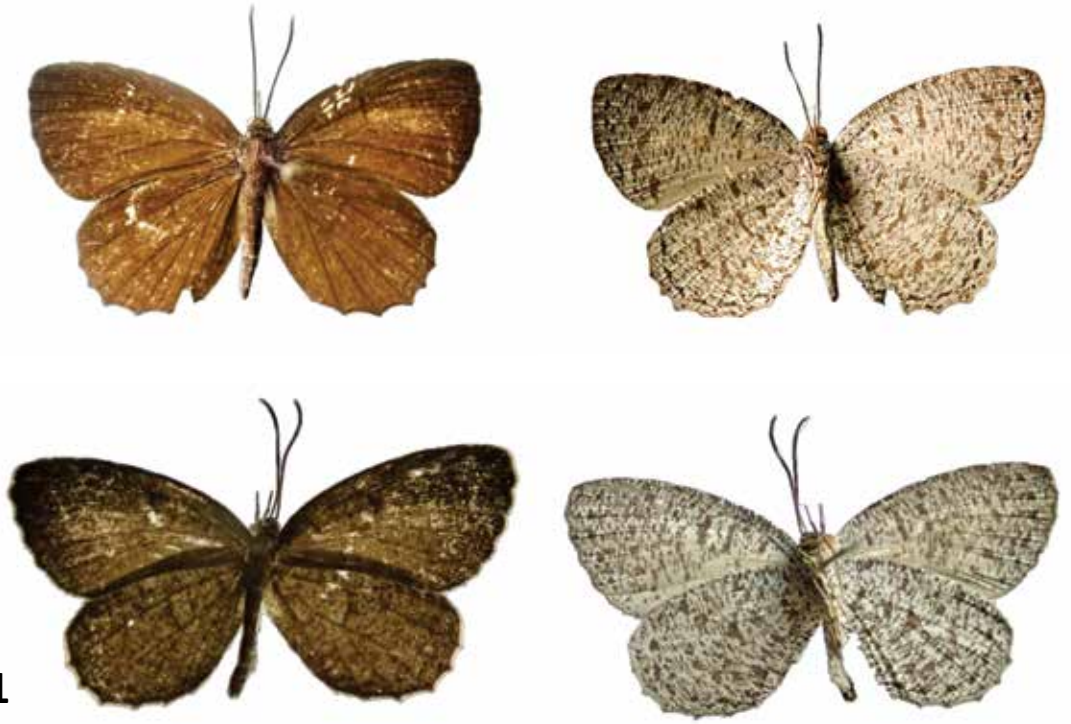
Notes: Observed flying low along the margins of small forest streams and over dense vegetation, low down in secondary forest glades. Adult butterflies milk sap sucking Hemiptera inserting their long proboscis into honey dew droplets secreted by the bug. ***A. unicolor*** caterpillars are predators of sap sucking insects: aphids, coccids, psyllids and membracids.

2. *Allotinus (Fabitaras) sarrastes* (Fruhstorfer, 1913)

Specimens: C86♂C87♀C153, (photograph above right)
WL: 18 mm ♂, 15 mm♀
Distribution: Thailand to Borneo.

There are several very similar species of ***Allotinus***. We have tentatively identified these specimens as ***A. serrastes sensu*** Seki et al (Butterflies of Borneo, volume 2). Our specimens have clear white spots around the margins of the underwings.

Notes: Observed flying low along the margins of small forest streams and over dense vegetation, low down in secondary forest glades. We observed and caught a mating pair which are shown in the photograph. Males have more pointed wings than females. (note that there are shadows on the underside of the female hindwing).



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Family Lycaenidae
Subfamily Miletinae
Tribe Miletini

1. *Logania regina* (Druce, 1873)
Rounded Mottle

Specimens: C44
WL: 12 mm
Distribution: Malaysia, Philippines, Indonesia.

Notes:

2. *Logania malayica* (Distant, 1884)
Malayan Mottle

Specimens: C30, C91
WL: 14 mm
Distribution: Malaysia, Philippines, Indonesia.

Notes: It is reported that adult butterflies rest at night with aphids of the genus ***Pseudoregma*** and protected by ants of the genus ***Leptothorax***. Adult butterflies feed on the aphid honeydew. Caterpillars are attacked by ants that "milk" honeydew from the aphids. It is suggested that caterpillars will feed on aphids.

Family Lycaenidae
Subfamily Miletinae
Tribe Miletini

1

2

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Upolampes

1. *Discolampa ethion* (Westwood, 1851)
Banded blue Pierrot

Specimens: C151♀,C155♀(lower), C181♂(top), C205♂(middle)
WL: 12 mm
Distribution India to Indonesia.

Notes: Frequently by small streams in Lesan Dayak secondary forest. Mud puddling species. Life cycle known.

2. *Caleta elna* (Hewitson,1876)
Elbowed Pierrot

Specimens: C84
WL: 14 mm
Distribution: India to Indonesia.

Notes: At least 6 subspecies reported. The Subspecies reported from Borneo is ***C. e. elvira*** (Fruhstorfer, 1918). Collected along shallow stream in secondary lowland rainforest. Known to settle on wet soils in mixed species aggregations, mud puddling.

Less frequent than the more common Blue banded Pierrot in Lesan Dayak forests.

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Upolampes

1

2

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Lycaenopsis

1. *Lycaenopsis haraldus* (Fabricius, 1787)
Felder's Hedge Blue

Specimens: C150 ♀
WL: 14 mm
Distribution India to Indonesia.

Notes: Several subspecies reported. ***Lycaenopsis haraldus cornuta*** (Druce, 1873) is the subspecies reported from Borneo.
Uncommon. Collected in secondary rainforest.

2. *Neopithecops zalmora* (Butler, 1870)
Inordinate Blue, Quaker

Specimens: C4
WL: 12 mm
Distribution India, China to Malaysia.

Notes: Uncommon. Collected in secondary rainforest. Our specimen was greatly damaged and the only one we found. Larvae reported to feed on Ebony trees and citrus.

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Nacaduba

3. *Nacaduba kurava* (Moore, 1858)
Transparent Six-line Blue

Specimens: C78 ♂ , C79, C80 ♂ , C89 ♂
WL: 13 mm
Distribution: There are at least 29 subspecies of ***N. kurava*** reported from India to Indonesia. Since ***N. perusia*** (Felder, 1860) has been synonymised with ***N. kurva nemana,*** the subspecies for Borneo is ***Nacaduba perusia nemana*** (Fruhstorfer, 1916).

Notes: Caterpillars reported to feed on ***Embelia*** in the Primulaceae.

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Upolampes

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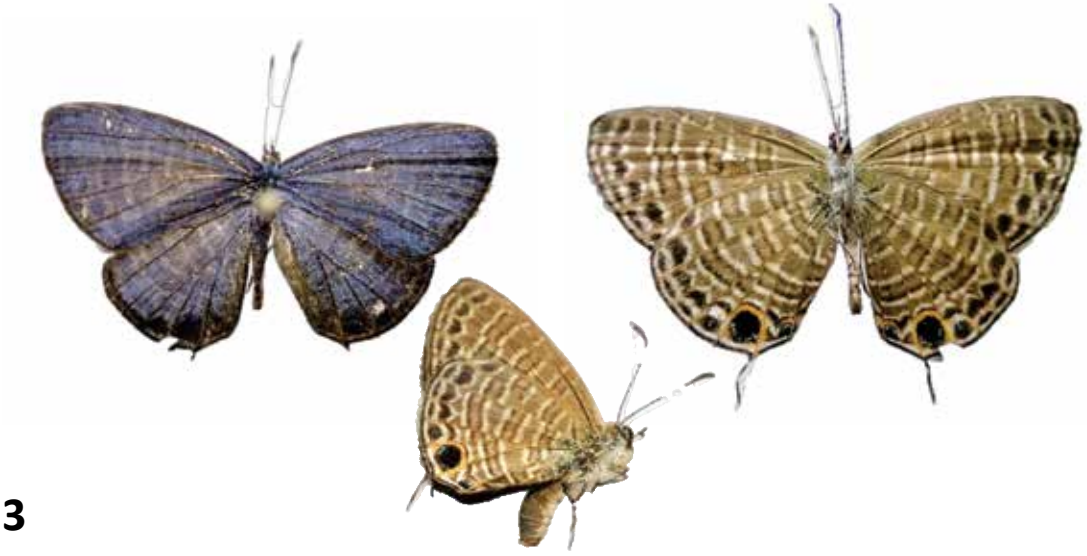
Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Nacaduba



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Family Lycaenidae
Subfamily Polyommatinae
Tribe Lycaenesthini

1. *Anthene lycaenina miya* (Fruhstorfer, 1916)
Pointed Ciliate Blue

Specimens: C2, C10, C27♂, C28♂, C78, C220♂
WL: 13 mm
Distribution: There are several subspecies of ***A. lycaenina*** (C. Felder, 1868) between India and Indonesia. Our specimens agree well with descriptions of subspecies ***A. l. miya*** from Sabah which, like our specimens lacks the black pigment within in the white circle on the under hindwing costa (cell 7) as found on the type species.

Notes: common in secondary lowland rainforest along trails and near water.

2. *unidentified tiny blue A*

Specimens: C29,
WL: 13 mm

3. *unidentified tiny blue B*

Specimens: C8a, C90,
WL: 12 mm

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3

Family Lycaenidae
Subfamily Theclinae
Tribe Arhopalini
Group Arhopala

1. *Arhopala elopura* (Druce, 1894)?
Oakblue

Specimens: C13♂, C45♀, C57♀, C106♂, C170♀, C112♀?,
WL: 22 mm (C106♂), 28mm (C57♀)

Distribution: ***Arhopala elopura elopura*** is found in Borneo, Sumatra and Peninsular Malaysia.

Notes: Subspecies ***A. e. dama*** Swinhoe, 1911 has been reported from Burma and Thailand to Vietnam and Langkawi and Mergui. C112 has a more defined underwing pattern that looks similar to ***Arhopala vihara vihara*** (C. Felder & R. Felder, 1860)?, the Large Spotted Oakblue. However, it was collected with the other specimens and so I have recorded it as ***Arhopala elopura*** (Druce,1894)?

At least 91 species in this genus are reported from Borneo. In the Alitaeus Group, these specimen most closely resembles ***A. elopura*** from Brunei. ***Arhopala vihara vihara, A. democritus, A. denta*** and ***A. pseudomuta*** have very similar wing patterns. It is identified by the lack of a spot at the base of space 10 on the under forewing and underwing markings that barely contrast with ground colour. However, some specimens have a clearer wing pattern than others in our samples. Clearly this genus is in need of research and revision.

Sexually dimorphic; dorsally, males are pure blue, females have dark borders to the wings.

Family Lycaenidae
Subfamily Theclinae
Tribe Arhopalini
Group Arhopala

C13

C106

C57

C112

1

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Catochrysops

1. *Catochrysops panormus* (C. Felder, 1860)
Silver forget-me-not

Specimen: C126 ♂ C175 ♂
WL: 17 mm
Distribution: India to the Philippines and Australia.

Notes: Known to feed on Mimosaceae and Papilionaceae and is associated with ants.

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Catochrysops

1

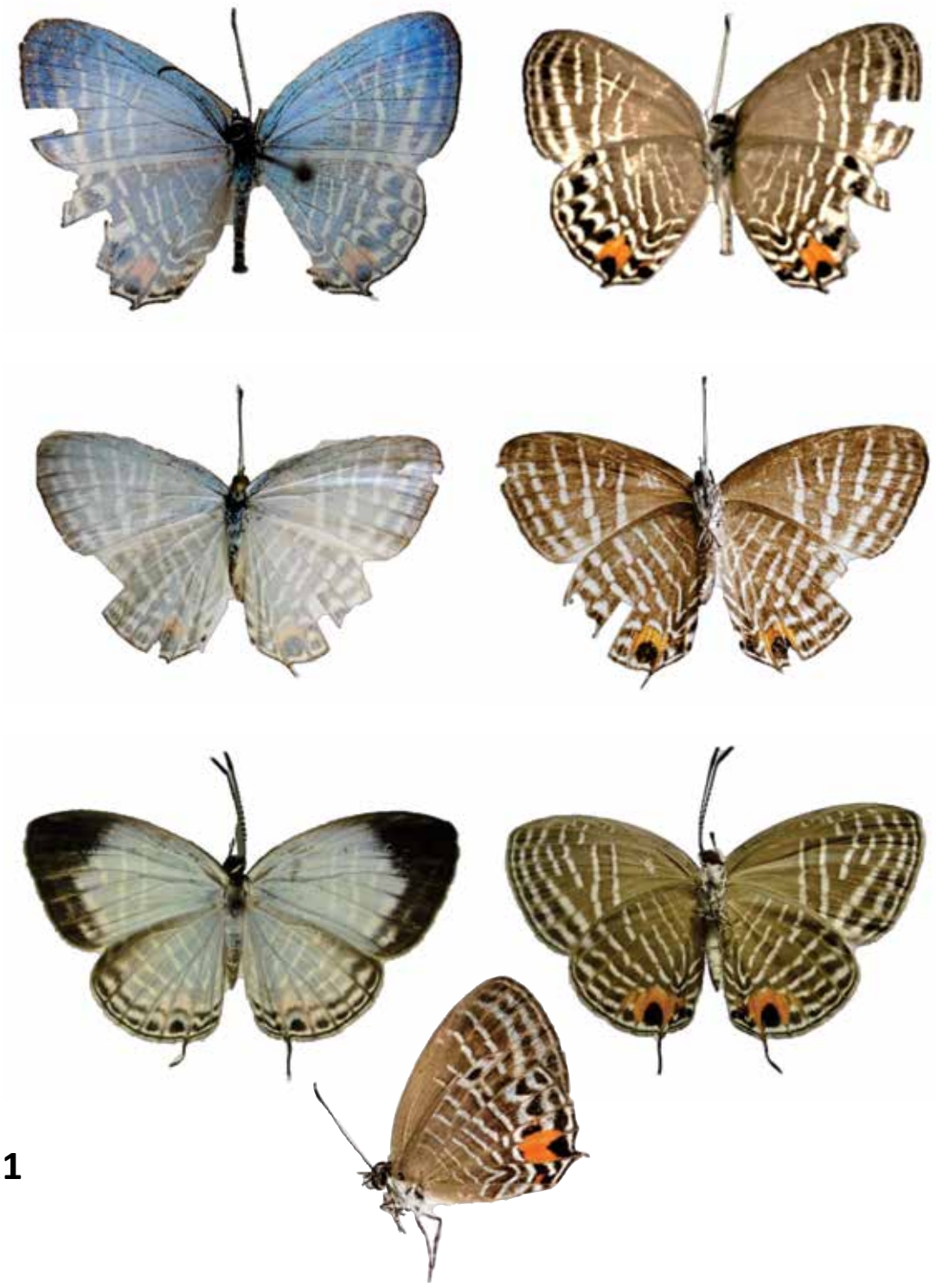
Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Jamides

1. *Jamides philatus* (Snellen, 1887)
Burmese Caerulean

Specimen: C221 ♂ (blue form) C60 ♂ (pale form), C66 ♀, C121 ♀, C152 ♀
WL: 17 mm ♂, 15 mm ♀

Distribution: ***jamides philatus*** (Snellen, 1887) is widespread from Burma to Indonesia. The subspecies found on Borneo is ***J. p. aamathaeus*** (Frustorfer, 1916). The wedge shaped black submarginal spots are characteristic of this species. Sexually dimorphic, Females have dark wing tips. There are paler and more blue male specimens in our catch.

Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Jamides



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Family Lycaenidae
Subfamily Polyommatinae
Tribe Polyommatini
Group Jamides

1. *Catapaecilma elegans* (Druce,1873)

Specimens: C65, C68, C120a, C169
WL: 12 mm
Distribution: Malaysia and Indonesia.

Notes: Borneo is the type location for this species. ***Catapaecilma harmani*** Cassidy 1982, a very similar species, is reported from Brunei. It is a darker species. Found in shady areas near streams in secondary lowland rainforest.

Family Lycaenidae
Subfamily Theclinae
Tribe Catapaecilmatini

2. *Amblypodia narada* (Horsfield, 1828)
Leaf Blue

Specimens: C170
WL: 25 mm
Distribution: Malaysia and Indonesia.

Notes: ***Amblypodia narada salvia*** Fruhstorfer, 1907 is a reported Bornean subspecies

Found in secondary lowland rainforest. The photograph taken in the field looks very much like the photograph in Wikkipedia names as ***A. anita*** (Moore, 1862).

Family Lycaenidae
Subfamily Theclinae
Tribe Catapaecilmatini

1

Family Lycaenidae
Subfamily Theclinae
Tribe Amblypodiini

2

Family Lycaenidae
Subfamily Theclinae
Tribe Cheritrini

1. *Ritra aurea* (Druce, 1872)

Specimens: C217
WL: (reported wingspan 35-40 mm)
Distribution: Malaysia Philippines, Sumatra, Borneo.

Notes: Borneo is the type location for this species. There are four subspecies ***R.a.aurea*** is the subspecies for Borneo.

Found in shady areas near streams in secondary lowland rainforest.

2. *Drupadia cindi* (Cowan, 1974)

Specimens: C157
WL: 11-12 mm
Distribution: Malaysia Borneo.

Notes: Borneo is the type location for this species.

Found in shady areas near streams in secondary lowland rainforest.

Family Lycaenidae
Subfamily Theclinae
Tribe Cheritrini

1

2

Family Lycaenidae
Subfamily Theclinae
Tribe Cheritrini

1. *Drupadia naisca* (Rober, 1886)
Posy

Specimens: C103, C41, C102, C223, C228, C230
WL: 16 mm
Distribution: There are at least 12 subspecies reported, two from Borneo, ***Drupadia niasica thaenia*** (Druce, 1895) and ***Drupadia niasica ultra*** (Cowan, 1974). Our specimens were common in the lowland secondary forest of Lesan Dayak.

2. *Hypolycaena amasa maximinianus* (Fruhstorfer, 1912)

Specimens: C31
WL: 14 mm
Distribution: There are 7 subspecies of ***Hypolycaena amasa*** (Hewitson, 1865) reported from India to Indonesia. ***H. a. maximinianus*** (Fruhstorfer, 1912), the Bornean subspecies was common in the lowland secondary forest of Lesan Dayak and particularly near small, shady, shallow streams.

Family Lycaenidae
Subfamily Theclinae
Tribe Cheritrini

1

Family Lycaenidae
Subfamily Theclinae
Tribe Hypolycaenini

2

Family Lycaenidae
Subfamily Theclinae
Tribe Deudorigini
Group Deudorix

1. *Rapala varuna* (Hewitson, 1863)
Indigo Flash

Specimens: C42, C43
WL: 14 mm
Distribution: India and China to Australia. There are 12+ subspecies. ***R. v. saha*** (Fruhstorfer, 1912) is the subspecies reported for Borneo.

Notes: Known life cycle. Caterpillars feed on several families of plants including Lychee. Two specimens are depicted to show wing patterns.

Family Lycaenidae
Subfamily Theclinae
Tribe Deudorigini
Group Deudorix

1

Superfamily Papilionioidea

Family Nymphalidae

Unidentified brown: Subfamily: Satyrinae,
Tribe Satyrini, Subtribe Mycalesina

Euploea eunice (Godart, 1819)
Bluish-White Spotted Crow / blue-banded king crow
Hair pencils

Family Nymphalidae
Subfamily: Danainae
Tribe Danaini
Subtribe Danaina

1. *Danaus genutia intensa* (Moore, 1883)
Common Tiger

Specimens: C52 ♀,
WL: 39 mm
Distribution: ***Danaus genutia*** (Cramar, 1779) is found from India to Australia. ***Danaus genutia intensa***(Moore, 1883) is the Bornean subspecies.

Notes: Distasteful to birds. Males have a have a black androconialscent patch on the dorsal hind wings which it flutters to attract females. Hair pencils that project from the tip of the abdomen also release pheromone in courtship. They were seen to patrol the margins of lowland secondary forests.

Life cycle well known. Larvae feed on and sequester toxins from Asclepiadaceae.

2. *Parantica aspasia aspasia* (Fabricius, 1787)
Yellow Glassy Tiger

Specimens: C21
WL: 44 mm
Distribution: Vietnam to Indonesia.

Notes: Frequent species around secondary rainforests. Larvae feed on and sequester toxins from Asclepiadaceae. It is therefore distasteful to birds.

3. *Ideopsis vulgaris* (Butler, 1874)
Blue Glassy Tiger

Specimens: C19, C20,
WL: 42 mm
Distribution: Burma to Indonesia. The Bornean subspecies is ***I. v. interposita****.*

Notes: Common species around secondary rainforests and kampongs. Larvae feed on and sequester toxins from Asclepiadaceae. It is therefore distasteful to birds and is mimicked by ***Papilioclyta,*** the common mime*,* which is edible to birds.

Family Nymphalidae
Subfamily: Danainae
Tribe Danaini
Subtribe Danaina

1

2

3

Family Nymphalidae
Subfamily: Danainae
Tribe Danaini
Subtribe Euploeina

1. *Idea stolli* (Moore, 1883)
Ashy white Tree Nymph

Specimens: C119
WL: 72 mm
Distribution: Malaysia to Indonesia. Several variations and subspecies. ***I. s. virgo*** (Fruhstorfer, 1903) [Sabah] and ***I.s. alcine*** (Fruhstorfer, 1910) [Sawarak] are the Bornean subspecies. Our species is most like ***I. s. virgo***.

Notes: Frequently seen along trails in lowland secondary forests.

Life cycle well known. Feeds on the lianas such as ***Aganosma cymose*** (Roxb, 1832).

Family Nymphalidae
Subfamily: Danainae
Tribe Danaini
Subtribe Euploeina

2. *Euploea crameri* (Lucas, 1853)
Spotted Black Crow

Specimens: C191
WL: 42 mm
Distribution: Burma to Indonesia. The holotype is from Borneo. There are two further subspecies ***E. c. daatensis*** (Moore, 1883) and ***E. c. labuana*** (Moore, 1883) reported from Pulau Daat and Labuan respectively.

Notes: Distasteful to birds. Our specimen was from the margins of lowland secondary forests.

Family Nymphalidae
Subfamily: Danainae
Tribe Danaini
Subtribe Euploeina

1

2

Family Nymphalidae
Subfamily: Danainae
Tribe Danaini
Subtribe Euploeina

1. *Euploea mulciber* (Cramer, 1777)
Striped Blue Crow

Specimens: C55 ♂,C97 ♂,C139 ♂, C145 ♂
WL: 44 mm
Distribution:South Asia: China to Indonesia. ***E. e. syra*** (Fruhstorfer, 1902) is the Bornean subspecies.

Notes: Distasteful to birds. Males have hair pencils that evert from the tip of the abdomen to release pheromone in courtship. Males were common along the margins of lowland secondary forests. Life cycle well known.

2. *Euploea cameralzeman* (Butler, 1866)
Malayan Crow

Specimens: C38 ♂,C88
WL: 57-64 mm
Distribution: Burma to Indonesia.Several subspecies, ***E. c. scudderi*** (Butler, 1878) is the Bornean subspecies.

Notes: Distasteful to birds. Males have hair pencils that evert from the tip of the abdomen to release pheromone in courtship. Males were common along the margins of lowland secondary forests. Life cycle well known.

3. *Euploea eunice* (Godart, 1819)
Bluish-White Spotted Crow/blue-banded king crow

Specimens: C6, C7, C85
WL: 43 mm
Distribution:South Asia: China to Indonesia. ***E. e. syra*** (Fruhstorfer, 1902) is the Bornean subspecies.

Notes: Distasteful to birds as caterpillars sequester toxins from milkweed plants they eat. Males have hair pencils (photographs) that evert from the tip of the abdomen to release pheromone in courtship. They were seen to patrol the margins of lowland secondary forests.

Life cycle well known.

Family Nymphalidae
Subfamily: Danainae
Tribe Danaini
Subtribe Euploeina

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3

Family Nymphalidae
Subfamily: Satyrinae
Tribe Elymniini

1. *Elymnias panthera* (Fabricius, 1787)
Studded or Tawny Palmfly

Specimens: C211, C213
WL:

Distribution: Malaysia and Indonesia. Of the approximately 18 subspecies, ***Elymnias panthera lacrima*** (Fruhstorfer, 1904) is reported from Borneo.

Notes:

Family Nymphalidae
Subfamily: Satyrinae
Tribe Zetherini

2. *Neorina lowii* (Doubleday, 1849)
Malayan Owl

Specimens: C116
WL: 47 mm
Distribution: Malaysia to Indonesia.

Notes: Caught in traps baited with fruit.

Family Nymphalidae
Subfamily: Satyrinae
Tribe Elymniini

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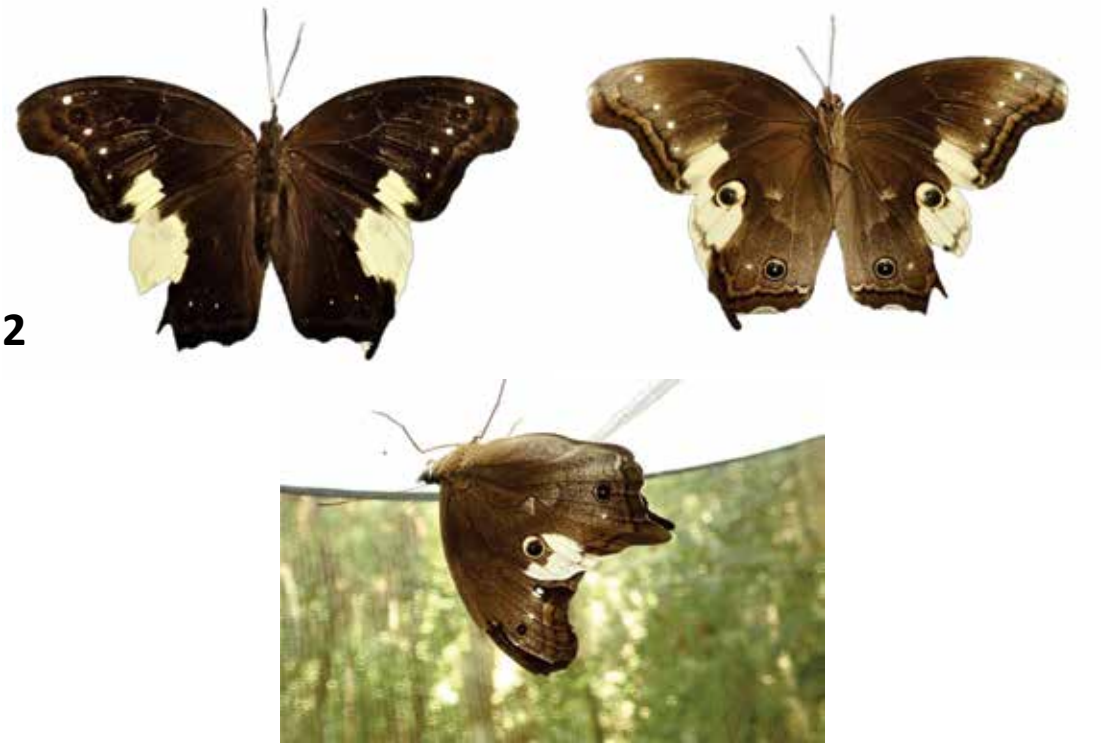
Family Nymphalidae
Subfamily: Satyrinae
Tribe: Zetherini



2

Family Nymphalidae
Subfamily: Satyrinae
Tribe Amathusiini

1. *Amathuxidia amythaon*(Doubleday, 1847)
Koh-i-noor

Specimens: C162
WL: 56 mm
Distribution: India to Indonesia.

Notes: *A. a. octacilia* (Fruhstorfer, 1911) and ***A. a. ottomana*** (Butler, 1869) are subspecies reported from Borneo. Found in the secondary lowland rainforest. Reported to prefer dense vegetation.

2. *Zeuxidia auirius* (Cramer, 1777)
Great Saturn

Specimens: C239 ♀,
WL: (reported to be 70 mm, wingspan 145 mm))
Distribution: two subspecies reported for Borneo: ***Zeuxidia aurelius aureliana*** (Honrath, 1885) and ***Zeuxidia aurelius euthycrite*** (Fruhstorfer, 1906).

3. *Thaumantis noureddin* (Westwood, 1851)
Dark jungle glory

Specimens: C165
WL: 50 mm
Distribution: Malaysia to Borneo. Blue iridescence on fore and hind wings.

Notes: *T. n. noureddin*, ***T. n. chatra*** (Fruhstorfer, 1905) and ***T. n. sultanus*** (Stichel, 1906) are reported from Borneo. Ours most closely resembles ***T. n. chatra*** (Fruhstorfer, 1905)

Family Nymphalidae
Subfamily: Satyrinae
Tribe Amathusiini

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Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Eritina

1. *Coelites euptychioides* (C. & R. Felder, 1867**)**
Restricted Catseye

Specimens: C159
WL: 35 mm
Distribution: Thailand to Borneo.

Notes: Found in the secondary lowland rainforest . Reported to prefer dense vegetation.

Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Ragadina

2. *Ragadia makuta* (Horsfield, 1829**)**
Striped Ringlet

Specimens: C122, C154, C172

WL: 27 mm

Distribution: Thailand to Borneo.

Notes: Found in the secondary lowland rainforest. Slow fliers along forest trails. Larvae reported to feed on ***Selaginella***, spikemoss. Populations reported to crash with too much rain or severe drought. It was common along our trails after a dryer period of several weeks.

Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Eritina

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Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Ragadina

2

Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Mycalesina

1. *Mycalesis anapita* (Moore, 1858)
Common Bush Orange/Common Bush Brown

Specimens: C174, C178
WL: 27 mm
Distribution: Burma to Borneo..

Notes: Grassland species found in oil palm plantations. Found in clearings and margins of secondary forest. Oil Palm Plantations were only 300 m away across a river from collection site.

2. *Mycalesis mineus* (Linnaeus, 1758)
Dark Banded Bush Brown

Specimens: C180
WL: 23 mm
Distribution: Burma to Borneo..

Notes: ***M. m. toshikoae*** Hayashi & Iwanaga 1974, is a subspecies reported from Borneo (Kuching).

Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Mycalesina

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Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Ypthima

1. *Ypthimapandocus* (Moore 1858)
Common Three-ring

Specimens: C136, C137
WL: 24 mm
Distribution: Malaysia, Indonesia.

Notes: Type species from Borneo. Life cycle well known.

We observed this species low down near the forest floor in secondary lowland tropical rainforest and old rubber plantations. Some specimens were bluish grey and others brown (photographs).

2. *Ypthima sp.*

Specimens: C37, C182, C185, C187
WL: 20 mm
Distribution:

Notes: Found at same locality as ***Y. pandocus***, but these specimens have only one spot (feint possibility of a second) on the hind underwing.

Family Nymphalidae
Subfamily: Satyrinae
Tribe Satyrini
Subtribe Ypthima

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4

Family Nymphalidae
Subfamily: Heliconiinae
Tribe Cethosiini

1. *Cethosia hypsea* (Doubleday, 1847)
Malayan Lacawing

Specimens: C69
WL: 51 mm
Distribution: Burma to Indonesia and the Philippines.

Notes: Adults are toxic to birds. Larvae are also toxic and sequester toxins from their food plants ***Adenia sp***. (Passifloraceae). They are found in lowland forests. We observed them in clearings, in glades, along trails and by river margins of secondary forests.

Subfamily: Heliconiinae
Tribe Vagrantini

2. *Cupha erymanthis* (Dury, 1773)
Rustic

Specimens: C12, C56, C81, C99
WL: 29 mm
Distribution: China, India to Indonesia.

Notes: At least 6 subspecies are reported, ***C. h. lotis*** (Sulzer, 1776) being the Malaysian form. They are found in disturbed forests and We caught them in traps baited with tinned sardines. They are known to be attracted to carcasses in sunny glades. Caterpillars are reported to feed on Flacourtiaceaesuch as the Indian plum ***Flacourtia rukam***.

3. *Cirrochroa satellita* (Butler, 1869)
Banded Yeoman

Specimens: C111
WL: 30 mm
Distribution: China to Indonesia. Two subspecies. ***C. s. illergeta*** (Fruhstorfer, 1912) is the subspecies reported from Borneo.

Notes: Our species was damaged and caught on a forest trail.

Family Nymphalidae
Subfamily: Heliconiinae

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Family Nymphalidae
Subfamily: Heliconiinae
Tribe Vagrantini

1 *Vindula dejone* (Erichson, 1834)
Lesser Cruiser

Specimens: C8 ♂, C100 ♂
WL: 38 mm
Distribution: India to Indonesia.

Notes: At least 18 subspecies are reported, ***V. d. dajakorum*** (Fruhstorfer, 1906) is the Bornean subspecies. Found by us in secondary rainforest and was considered a species of the primary lowland rainforest in the past. Observed on river shores mudpuddling and feeding on rotting fruit. Sexually dimorphic. Females are grey with a white band running down both wings. Males were very common mudpuddling on river banks with the similar looking ***Charaxes bernardus***, the Tawny Rajah (see photograph under ***C. bernardus***).

Family Nymphalidae
Subfamily: Heliconiinae
Tribe Vagrantini

1

Family Nymphalidae
Subfamily: Limentidinae
Tribe Adoliadini

1 Dolpha evelina (Stoll, 1970)
Red-spot Duke

Specimens: C108, C140
WL: 48 mm
Distribution: India to Indonesia

Notes: The red spot on the forewing is surprisingly conspicuous in the gloom of the forest (photographs). We recorded this in traps baited with fruit (photograph). Common in Lesan Dayak forests. Life cycle well known.

2. Euthalia anosia (Moore 1857)
Grey Baron

Specimens: C231
WL: (not measured)
Distribution: ***E. a. yapola*** (Fruhstorfer, 1913) Is the subspecies reported for Borneo.

Larval food unknown.

Family Nymphalidae
Subfamily: Limentidinae
Tribe Adoliadini

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Family Nymphalidae
Subfamily: Limentidinae
Tribe Adoliadini

1. *Euthalia dunya* (Doubleday, 1848)
The Great Marquis, Pearl's Necklace

Specimens: C124, C34, C104
WL: 48 mm
Distribution: found in Borneo, Sunderland north to Burma. Common in Lesan Dayak Protection forest. ***Bassarona dunya monara*** (Fruhstorfer, 1913) is the subspecies reported from Borneo and Palawan.

Larval food unknown.

2. *Euthalia teuta* (Doubleday, 1848)
The Banded Marquis

Specimens: C161 ♀, C75 ♀, C77 ♂ (above) C166 ♂

WL: ♀ 49mm, ♂ 39mm

Distribution: found in Borneo, Sunderland to India. Several subspecies. ***Bassarona teuta bellata*** (Druce, 1873) is the subspecies reported from Borneo. Common in Lesan Dayak Protection forest. Females are larger than males and much paler with a bluish-white discal band.

Larval food unknown.

Family Nymphalidae
Subfamily: Limentidinae
Tribe Adoliadini

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Family Nymphalidae
Subfamily: Limentidinae
Tribe Adoliadini

1. *Tanaecia pelea* (Fabricius, 1787)
The Malay Viscount

Specimens: C51 ♂ (above) C124a ♀,
WL: 34 mm
Distribution: Burma to Indonesia. Common in Lesan Dayak Protection forest and found in fruit baited butterfly traps. ***Tanaecia pelea pelea*** (Fabricius, 1787) is the subspecies reported from Borneo.

Notes: The colour and patterns of this species are variable.

2. *Tanaecia sp*. ???

Specimens: C224

WL: not measured.

Distribution:

Family Nymphalidae
Subfamily: Limentidinae
Tribe Adoliadini

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Family Nymphalidae
Subfamily: Limentidinae
Tribe Adoliadini

1. *Tanaecia sp.* ???

Specimens: C233, C234
WL: not measured
Distribution:

2. *Lexias canescens*
Yellow Archduke

Specimens: C225
WL: not measured
Distribution:

Notes:

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Family Nymphalidae
Subfamily: Lymentidinae

1. *Lebadea martha* (Fabricius, 1787)

Specimens: C203 ♀
WL: (reported as 29 mm)
Distribution: Widespread from India to Indonesia. The subspecies, ***L. m. paduka*** (Moore, 1857) is reported from Borneo.

Notes: Sexually dimorphic. Females lack the red and white colour of the males. Several species have a similar wing pattern including ***Tanaecia pelea*** (Fabricius, 1787).

Characteristic of wet lowland tropical forests including secondary forests, clearings, glades and along forest trails.

2. *Moduza pocris* (Cramer, 1777)
Commander

Specimens: C18, C101
WL: 35 mm
Distribution: Widespread from India to Indonesia. The subspecies ***M. p. agnatha*** (Frustorfer, 1897) is reported from Borneo.

Notes: Characteristic of wet lowland tropical forests including secondary forests, clearings, glades and kampongs. It was seen on the river beaches by the Lesan Dayak protection forest with other mud puddling species but is known not to be attracted to carrion or rotting fruit. Its caterpillars feed on Rubiaceaeplant species, especially ***Mussaenda frondosa***, the Dhobi tree.

Family Nymphalidae
Subfamily: Nymphalinae
Tribe Limenitidini

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Family Nymphalidae
Subfamily: Lymentidinae

1. *Lasippa tiga* (Moore, 1881)
Malayan Lascar

Specimens: C173,
WL: 24 mm
Distribution: Widespread from Burma to Indonesia. Found in and around secondary lowland forests.

Notes: Several similar species in the genus make them difficult to identify in the field.

The photograph of Lasippa is similar to C173 and I have included it here for completeness. However, it may be a different subspecies.

Family Nymphalidae
Subfamily: Nymphalinae
Tribe Limenitidini

1

Family Nymphalidae
Subfamily: Lymentidinae
Tribe Neptini

1. *Neptis leucoporus* (Fruhstorfer, 1908)
Burmese or Grey Sailor

Specimens: C132,
WL: 34 mm
Distribution: Widespread from Burma to Indonesia. The similar species, ***Neptis duryodana nesia*** (Moore, 1858) is also reported from Borneo. However, the white colour of the anterior dorsal abdomen in line with the white anterior line of the hindwing is diagnostic of ***N. leucoporus***. Four subspecies are reported from smaller islands. Common in Lesan Dayak Protection forest. Found in and around secondary lowland forests.

Notes: Several similar species in the genus make them difficult to identify in the field.

2. *Neptis duryodana nesia* (Moore 1858)
Malayan Sailor

Specimens: C62, C96
WL: 28 mm
Distribution: Widespread from Burma to Indonesia.

Neptis duryodana nesia (Moore, 1858) has a greenish shiny anterior abdominal segment dorsally which contrasts with the white of ***N. leucoporus***. The white markings of the underwings also differ in pattern. Flies in and around secondary lowland forests of Lesan Dayak.

3. *Neptis vikasi ragusa* (Eliot, 1969)
Dingy Sailor

Specimens: C135
WL: 29 mm
Distribution: ***Neptisvikasi*** (Horsfield, 1829) is widespread from Burma to Indonesia. Our specimen is very similar to the subspecies ***N. vikasiragusa*** from Sumatra.

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Family Nymphalidae
Subfamily: Cheraxinae

1. *Charaxes durnfordi everetti* (Rothschild, 1894)
Chestnut Rajah

Specimens: C164 ♂
WL: 58 mm
Distribution: found in Borneo. ***Charaxes durnfordi*** (Distant, 1884) is found from India to Indonesia. There are 6 subspecies.

2. *Charaxes distanti* (Honrath, 1885)
Malay rajah

Specimens: photograph only
WL: -
Distribution: *Charaxes distanti* (Honrath, 1885) found in Peninsula Malaysia and Indonesia. Subspecies ***infernus*** (Rothschild, 1903) is reported from Borneo. We observed these on river beaches aggregated in multispecies flocks with ***C. bernardus***. We only have a photographic record.

3. *Charaxes bernardus* (Fabricius, 1793)
Tawny rajah

Specimens: C73 ♂
WL: 38 mm
Distribution: *Charaxes bernardus* (Fabricius, 1793) found from India to Indonesia. There are at least 24 subspecies reported. ***Charaxes bernardusrepetitus*** (Butler, 1896) is the Bornean subspecies.

Notes: In lowland secondary forest, we observed these on river beaches aggregated in multispecies flocks feeding on urine soaked gravel (photo foreground). The photo compares it to a similar species ***Vindula dejone***, the lesser cruiser [in the background], with which it was commonly seen mudpuddling.

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Family Nymphalidae
Subfamily: Cheraxinae
Tribe Cheraxini

1. *Polyura hebe ganymedes* (Staudinger, 1886)
Plain Naweb

Specimens: C47
WL: 43 mm
Distribution: ***Polyura hebe*** (Butler, 1886) is found from Burma to Sumba.

Notes: It was seen on river beaches with ***Graphium*** species, around the margins of secondary lowland forest and kampongs.

Life History: Larvae are known to feed on Leguminosae, sub-family Mimosoideae including ***Adenanthera pavonia*** and ***Parkia speciose****.*

2. *Polyura delphis* (Staudinger, 1886)
Jewelled Naweb

Specimens: C179
WL: 50 mm
Distribution*:* India to Indonesia*.*

Notes: It was seen on river beaches on urine patches on beaches on margins of secondary lowland forest.

Family Nymphalidae
Subfamily Cheraxinae
Tribe Cheraxinae

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2

Family Nymphalidae
Subfamily: Cheraxinae
Tribe Prothoini

1. *Prothoe franck* (Godart, 1824)
Blue Begum

Specimens: C163
WL: 44 mm
Distribution: Indonesia.

Notes: The subspecies from Borneo is ***P. f. borneensis*** (Frustorfer, 1913). From secondary lowland rainforest. The white bar on the under forewing shows up in the low light of the forest. The blurred photograph shows a specimen in typical head down pose on a tree trunk.

Family Nymphalidae
Subfamily: Apaturinae

2. *Eulaceura osteria* (Westwood, 1850)
Elegant Emperor

Specimens: C212 ♂
WL: mm
Distribution: ***Eulaceura osteria*** (Westwood, 1850) is reported from Thailand to Indonesia. At least 9 subspecies are recognised, two from Borneo: ***E. osteria jembala*** (Fruhstorfer, 1913) and ***E. o. osteria*** (Westwood, 1850).

Notes: Sexually dimorphic. Male black with white streak above and shiny grey below. Female brown and patterned resembling the Malay Viscount.

Family Nymphalidae
Subfamily Cheraxinae
Tribe Prothoini

1

Family Nymphalidae
Subfamily: Apaturinae

2

Family Nymphalidae
Subfamily: Apaturinae

1. *Melanitis leda* (Linnaeus, 1758)
Common evening Brown

Specimens: C123, C238
WL: 41 mm
Distribution: Africa through Asia to Australia.

Notes: Variable morphology that changes the wet and dry seasons.

Of the two specimens depicted the top form is most like a dry season form and the lower picture with the more barred underwings is more like a dry season form. They exhibit strong “chase” behaviours and resident forms are known to fight off visiting individuals at dusk. We caught them with traps baited with fruit.

Caterpillars feed on grasses.

Family Nymphalidae
Subfamily: Apaturinae

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Family Nymphalidae
Subfamily: Biblidinae
Tribe Biblidini

1. *Laringa castelnaui* (Felder & Felder, 1860)
Blue Danay

Specimens: C93, C1001
WL: 25 mm
Distribution: Burma to Borneo.

Notes: There are two species in the genus and 5 subspecies of ***L. castelnaui***. ***L. c. ochus*** Fruhstorfer is the subspecies for Borneo.

Family Nymphalidae
Subfamily: Cyrestinae
Tribe: Cyrestini

2. *Chersonesia rahria* (Moore, 1858)
Wavy Maplet

Specimens: C16
WL: 18 mm
Distribution: Africa through Asia to Australia.

Notes: Primary lowland rainforest species found by us in secondary forest. They were particularly noticeable in glades along forest trails. They sit with their wings outspread in the manner of moths.

Caterpillars are known to feed on Ficus species, protect themselves within their own faeces.

3. *Cyrestis nivea* (Zinken, 1831)
Straight-line Mapwing

Specimens: C35
WL: 32 mm
Distribution: South East Asia.

Notes: >13 subspecies reported: ***C.n. nivalis*** (C&R Felder, 1867) and ***C. n. borneensis*** (Martin, 1903) from Borneo.

Primary lowland rainforest species found by us in secondary forest.

Family Nymphalidae
Subfamily: Biblidinae
Tribe Biblidini

1

Family Nymphalidae
Subfamily: Cyrestinae
Tribe: Cyrestini

2

3

Family Nymphalidae
Subfamily: Nymphalinae
Tribe Junoniini

1. *Hypolimnas bolima* (Linnaeus, 1758)
Blue Moon/Great Egg-fly

Specimens: C188 ♂ =1, C208=1a
WL: mm
Distribution: India, China to Australia.

Notes: Many subspecies. The type species and ***H. b. philippensis*** (Butler, 1874) are reported from Borneo. ***H. bolinais*** extremely sexually polymorphic with females having multiple forms that mimic local distasteful species. Specimen 1a mimics the milkweed butterflies so common around our camp: ***E. cameralzeman*** and ***E. mulcibar***. We observed this species in secondary lowland rainforest and along the gravel beaches of rivers, such as the specimen below.

2. *Junonia hedonia* (Linnaeus, 1764)
Spotted Chocolate Soldier

Specimens: C133
WL: -
Distribution: Philippines to Australia.

Notes: J. h. dayak (Hayashi 1972) is reported from Borneo.

Family Nymphalidae
Subfamily: Nymphalinae
Tribe Junoniini

1

1a

3

Family Nymphalidae
Subfamily: Nymphalinae
Tribe Kallimini

1. Kallima limborgii limborgii (Moore, 1878)
Malayan Oakleaf

Specimens: C36 ♀, C74 ♀
WL: 51 mm
Distribution: Thailand to Borneo.

Notes: Females are more drab and have less pointed tips to the wings than males. There is much variation in the underside wing pattern. Our winglengthmeasurements are larger than those given (37 mm) by Kirton (2018). Observed in forest glades, streams and the at margins of secondary lowland rainforest. Strong flier but settled quickly where it was difficult to see amongst dead leaves (photographed). However, several specimens observed showed damage consistent with bird attack (1a) where the spot on the front forewing has been targeted. Photographs below showing wing detail and how "tame" these butterflies can be.

2. *Doleschallia bisaltide* (Cramer, 1777)
Autumn Leaf

Specimens: C98
WL: 38 mm
Distribution: India, China to Australia.

Notes: Many subspecies. ***Doleschallia bisaltide borneensis*** (Fruhstorfer, 1899) is the subspecies reported from Borneo. We observed this species in Secondary Lowland rainforest along trails.

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1a

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Full List of named Butterfly species

Allotinus (Fabitaras) ***sarrastes*** (Fruhstorfer, 1913)
Allotinus (Fabitaras) ***sarrastes*** (Fruhstorfer, 1913)
Allotinus (Paragerydus) ***leogoron normani*** (Eliot, 1967)
Amathuxidia amythaon (Doubleday, 1847)
Amblypodia narada (Horsfield, 1828)
Anthene lycaenina miya (Fruhstorfer, 1916)
Appias nero (Fabricius, 1793)
Arhopala elopura (Druce, 1894)
Caleta elna elvira (Fruhstorfer, 1918)
Catapaecilma elegans (Druce, 1873)
Catochrysops panormus (C. Felder, 1860)
Catopsilia pomona (Fabricius, 1775)
Cepora judith (Fabricius, 1787)
Cepora judith (Fabricius, 1787)
Cethosia hypsea (Doubleday, 1847)
Charaxes bernardus (Fabricius, 1793)
Charaxes distanti (Honrath, 1885)
Charaxes durnfordi everetti (Rothschild, 1894)
Chersonesia rahria (Moore, 1858)
Cirrochroa satellita (Butler, 1869)
Coelites euptychioides (C. & R. Felder, 1867)
Cupha erymanthis (Drury, 1773)
Curetis santana malayica (C & R Felder, 1865)?
Curetis sperthis sperthis (C. & R. Felder, 1865)
Cyrestis nivea (Zinken, 1831)
Danaus genutia intensa (Moore, 1883)
Delias baracasa (Semper, 1890)
Discolampa ethion (Westwood, 1851)
Doleschallia bisaltide (Cramer, 1777)
Dolpha evelina (Stoll, 1970)
Drupadia cindi (Cowan, 1974)
Drupadia naisca (Rober, 1886)
Elymnias panthera (Fabricius, 1787)
Eulaceura osteria (Westwood, 1850)
Euploea cameralzeman (Butler, 1866)
Euploea crameri (Lucas, 1853)
Euploea eunice (Godart, 1819)
Euploea mulciber (Cramer, 1777)
Eurema hecabe hecabe (Linnaeus, 1758)
Eurema nicevillei nicevillei (Butler, 1898)
Eurema simulatrix tecmessa (de Nicéville & Martin, 1896)
Euthalia anosia (Moore, 1857)
Euthalia dunya (Doubleday, 1848)
Euthalia teuta (Doubleday, 1848)
Gandaca harina (Horsefield, 1829)
Graphium agamemnon (Linneus, 1758)
Graphium antiphates (Cramer, 1775)
Graphium bathycles bathycloides (Honrath, 1884)
Graphium doson (C. & R. Felder, 1864)
Graphium sarpedon (Linneus, 1758)
Hasora taminatus (Hübner, 1818)?
Hypolimnas bolima (Linnaeus, 1758)
Hypolycaena amasa maximinianus (Fruhstorfer, 1912)
Idea stolli (Moore, 1883)
Ideopsis vulgaris (Butler, 1874)
Ilema vaneeckei callima (Collenette, 1932)
Jamides philatus (Snellen, 1887)
Junonia hedonia (Linnaeus, 1764)
Kallima limborgii limborgii (Moore, 1878)
Koruthaialos sindu (C. & R. Felder, 1860)
Lamproptera meges (Zinken-Sommer, 1831)
Laringa casteinaui ochus (Fruhstorfer)
Lasippa tiga (Moore, 1881)
Lebadea martha (Fabricius, 1787)
Leptosia nina (Fabricius, 1793)
Lexias canescens (Butler, 1869)
Logania malayica (Distant, 1884)
Logania regina (Druce, 1873)
Lycaenopsis haraldus (Fabricius, 1787)
Melanitis leda (Linnaeus, 1758)
Moduza pocris (Cramer, 1777)
Mycalesis anapita (Moore, 1858)
Mycalesis mineus (Linnaeus, 1758)
Nacaduba kurava (Moore, 1858)
Neopithecops zalmora (Butler, 1870)
Neorina lowii (Doubleday, 1849)
Neptis duryodana nesia (Moore, 1858)
Neptis leucoporus (Fruhstorfer, 1908)
Neptis vikasi ragusa (Eliot, 1969)
Pachliopta antiphus (Fabricius, 1793)
Papilio (***Menelaides***) ***memnon*** (Linnaeus 1758)
Papilio demoleus (Linnaeus, 1758)
Papilio polytes (Linnaeus, 1758)
Papilio helenus enganius (Doherty, 1891)
Papilio nephalus (Boisduval, 1836)
Paralaxita telesia (Hewitson, 1861)
Parantica aspasia aspasia (Fabricius, 1787)
Polyura delphis (Staudinger, 1886)
Polyura hebe ganymedes (Staudinger, 1886)
Prothoe franck (Godart, 1824)
Ragadia makuta (Horsfield, 1829)
Rapala varuna (Hewitson, 1863)
Ritra aurea (Druce, 1873)
Tanaecia pelea (Fabricius, 1787)
Thaumantis noureddin (Westwood, 1851)
Trogonoptera brookiana (Wallace, 1885)
Vindula dejone (Erichson, 1834)
Ypthima pandocus (Moore, 1858)
Zemeros emesoides (C. & R. Felder, 1860)
Zeuxidia aurelius (Cramer, 1777)

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