Catalogue of Swallowtail Butterflies (Lepidoptera: Papilionidae) at BORNEENSIS

Compiled by:
AKINORI NAKANISHI, MOHD. FAIRUS JALIL & NORDIN WAHID

Photographs by:
AKINORI NAKANISHI & AZRIE ALLIAMAT
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The Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah, has a reference collection center called BORNEENSIS. Under the Bornean Biodiversity and Ecosystem Conservation (BBEC) programme, we hope to establish it to be a center form taxonomy and systematic studies for Bornean fauna and flora of the region. In line with this effort we produced records of what is kept at BORNEENSIS, and this book is one. At the same time this small book will act as a guide for those involved with conservation, including students, staff, rangers and naturalists. As we all know butterfly has always been of interest to many people, we hope it will be useful to you too.

ITBC is indebted to the authors and wish they will keep on upgrading his book form time to time. ITBC is equally indebted to JICA for all the expertise and fund provided under the BBEC.

Professor Datin Dr. Maryati Mohamed
Director
Institute for Tropical Biology & Conservation (ITBC)
Universiti Malaysia Sabah (UMS)
Preface

Over the years, the Institute for Tropical Biology and Conservation (ITBC) has built up a significant collection of insect specimens of Sabah. This is the result of personal research and scientific expeditions and these specimens form part of the BORNEENSIS collection. Of particular interest are the collections of butterflies, ants and cicadas.

To manage and arrange the ever increasing specimens' data efficiently, it was felt that a database system was necessary. As a result, a database system (Musebase) was established in 2003 at the ITBC and the collection management has just started to utilize the system.

Butterflies form one of the most attractive and important groups in the insect world for understanding biodiversity and conservation. This is especially true of swallowtail butterflies because of their beauty and popularity. The purpose of publishing this book is to present the swallowtail butterflies collection at BORNEENSIS so that other institutes, researchers and members of the public can appreciate what is available. In addition, we hope that this book will be utilized as a pictorial guide for identifying swallowtail butterflies in the field and laboratory.

This catalogue is one of the outputs of our activities. We are thankful to Japan International Cooperation Agency (JICA) for supporting this publication through the Bornean Biodiversity and Ecosystems Conservation (BBEC) programme in Sabah.

Editors

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CD-ROM
Checklist of the family Papilionidae stored at BORNEENSIS
Introduction

Swallowtail butterflies are one of the most beautiful members in the order Lepidoptera. They belong to the family Papilionidae which includes some of the largest butterflies in the world, the famous *Ornithoptera alexandrae*, Queen Alexandra Birdwing butterflies of Papua New Guinea. This goliath has a wingspan exceeding 11 inches. In Sabah, the titles belong to the birdwing butterflies *Troides amphrysus* with a female wingspan of about 90 millimeters.

Sabah is blessed with many beautiful and endemic butterfly species. From the total of 956 species that has been recorded in Borneo, about ten percent are endemic. Of the 44 species of swallowtail butterflies recorded in Sabah, four species are endemic.

In this catalogue, a total of 37 species, including four endemic species, are treated. All specimens used in this catalogue are kept as BORNEENSIS at Institute for Tropical Biology and Conservation (ITBC). The specimens' data are put into the ITBC database (Musebase). The list of the swallowtail butterflies stored at ITBC is included in the attached CD-ROM.
Life History

Butterflies undergo four stages of development from egg to caterpillar, pupa and adult. Adult life span ranges from few days to few months depending on species. The host plant families for the Bornean Papilionidae are Aristolochiaceae, Annonaceae, Lauraceae, Hernandiaceae and Rutaceae. The majority of this hostplants contains alkaloids or phenolic which is a potential source of insect defence mechanism.

Most of the eggs are round and have little or no sculpturing. Some species have waxy substance covered the eggs. All the first instar has tubercles but the latter instar may be with or without tubercles. All members of the genus *Troides* have fleshy tubercles, while most of the species in the genus *Papilio* are without fleshy tubercles. Some of the larva have osmeteria which will be exposed when the larva are alarmed or to deter predator.

A silken girdle that passes across the third thoracic segment and wings fastens all pupae of Papilionids to the substrate. The coloration and the shape of the pupae are invariably cryptic.

The life history of Yellow-bodied Clubtail

*Pachliopta (Losaria) neptunus* (Guerin-Meneville, 1840)
Butterflies Habitats

Butterflies can be found almost anywhere from an urban area such as in Kota Kinabalu to the forest of Danum Valley and as high as Mount Kinabalu. In Sabah, Mount Kinabalu recorded an outstanding 625 species of butterflies within it boundaries making it one of the highly diverse areas on butterflies' sake. The number recorded there are higher than the whole of Europe who species numbers at the pathetic 365 species.

1. Urban Area
In the Urban areas, most butterflies utilize species which are used as ornamental for reproduction. The Lime butterfly, *Papilio demoleus*, uses the common lime to reproduce.

2. Mangroves and Peat Swamp
In this hostile environment, butterflies have to adapt to high temperature and poisonous food plant with thick layer of waxy substances.

3. Lowland Open Country Areas
This includes scrubland, plantation, parks, garden and isolated forested areas. Here common species like *Eurema dominantes* and members of the Satyrinae of Nymphalidae are particularly common.

4. Lowland Forests
Here, many interesting species especially the elusive *Zeuxidia* and *Thaumantis* can readily be found. Here is where the highest diversity can really be appreciated.

5. Highland Forests
In Sabah, highlands are dominated mostly by endemics species like *Graphium procles, G. stratiotes, Troides andromache* etc.
Swallowtail Butterflies of Sabah

FAMILY PAPILIONIDAE
SUBFAMILY PAPILIONINAE

Troides (Trogonoptera) brookiana
Troides (Troides) helena
Troides (Troides) amphrysus
Troides (Troides) miranda
Troides (Troides) andromache*
Parides (Atrophaneura) nox
Pachliopta (Losaria) neptunus
Pachliopta (Pachliopta) aritstolochiae
Chilasa slateri
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Papilio (Princeps) demoleus
Papilio (Princeps) demolion
Papilio (Princeps) nephelus
Papilio (Princeps) helenus
Papilio (Princeps) iswaroides
Papilio (Princeps) iswara
Papilio (Princeps) fuscus
Papilio (Princeps) polytes
Papilio (Princeps) alphenor
Papilio (Princeps) memnon
Papilio (Princeps) acheron*
Papilio (Princeps) karna

Papilio (Princeps) palinurus
Meandrusa payeni
Graphium sarpedon
Graphium empedovana
Graphium doson
Graphium evemon
Graphium eurypylus
Graphium procles*
Graphium bathycles
Graphium agamemnon
Graphium ariyces
Pathysa (Pathysa) agetes
Pathysa (Pathysa) stratiotes*
Pathysa (Pathysa) aristeus
Pathysa (Pathysa) antiphates
Pathysa (Pathysa) decolor
Pathysa (Paranticopsis) macareus
Pathysa (Paranticopsis) megarus
Pathysa (Paranticopsis) ramaceus
Pathysa (Paranticopsis) delessertii
Lamproptera curius
Lamproptera meges

* indicates an endemic species.

This photo is a
Troides
(Trogonoptera)
brookiana pausing
on the leaf.
Rajah Brooke's Birdwing

Species: *Troides (Trogonoptera) brookiana*
Food Plant: *Aristolochiacea (Aristolochia sp.)*
Habitat: Low mountainous areas between 200 to about 1500m a.s.l.

*T. brookiana* is the only representative of the subgenus *Trogonoptera*. This large birdwing is a common sight in Danum Valley and Poring Hot Spring. The male usually congregates at the riverbanks and the female tends to be active at late evening. In Mahua Waterfall Crocker Range, the female seems to be more abundant compared to male. The butterfly has been bred using *Aristolochia tagala* and *A. foveolata.*
Common Birdwing

Species: *Troides (Troides) helena*

Food Plant: *Aristolochiaceae (Aristolochia sp.)*

Habitat: Low mountainous areas between 200 to About 1500m a.s.l.

In male an isolated black spot on hindwing 1b can be seen, while in female there are black submarginal spots in a line. It frequents forest clearings, and is seen occasionally near villages. *Troides helena* is widely distributed in the Oriental region.
Malay Birdwing

Species: *Troides (Troides) amphrysus*
Food Plant: *Aristolochiaceae (Aristolochia sp.)*
Habitat: Low mountainous areas between 200 to About 700m a.s.l.

*T. amphrysus* is the most common and by far the largest among all four species of the subgenus *Troides*. A variation in the colour of the neck has been observed extending from pale yellow to crimson red. Usually found singly or in group.
Species: *Troides (Troides) miranda*

Food Plant: *Aristolochiaceae (Aristolochia sp.)*

Habitat: Lowlands to low mountainous areas at about 500 m a.s.l.

Female. Forewing on both sides purple brown. Hindwing central spots small.

Male. Forewing with subapical white line along veins.

Distribution: Borneo & Sumatra.

---

Male, upperside

Female, upperside

Female. Forewing on both sides purple brown. Hindwing central spots small.

Male. Forewing with subapical white line along veins.

Distribution: Borneo & Sumatra.
Species: *Troides (Troides) andromache*
Food Plant: *Aristolochiaceae (Aristolochia sp.)*
Habitat: Mountainous areas between 1000 to about 2000m a.s.l.

Female. Forewing ground color light brown. There are only two female specimens of this species at BORNEENSIS. It seems whitish when it is flying. Endemic to Borneo.
Malayan Batwing

Species: *Parides (Atrophaneura) nox*
Food Plant: *Aristolochiaceae & Piperaceae*
Habitat: Low mountainous areas between 200 to about 800m a.s.l.

Male, upperside

Female, upperside

*A. nox* is the only representative of the genus. There are two subspecies – ssp. *noctis* and ssp. *banjerma*ina. The latter is being found only on the southern side of Kalimantan. The butterfly could be easily netted while nectaring on the flower of *Saraca* plants. In Tabin a record of more than 30 individuals have been observed nectaring on the flower of *Saraca* near the river, most of them are male.
Both sexes have narrow and long tails of club-like shape peculiar in bright carmine subtornal patch on the hindwing, and the distal half of the abdomen is bright yellow. This species was found flying round Saraca blossoms in the Crocker Range Park. It is distributed from northeast India and Hainan Island to Sulawesi excluding the Philippines.
Common Rose

Species: *Pachliopta (Pachliopta) aristolochiae*
Food Plant: *Aristolochiaceae (Aristolochia tagala & Thottea sp.)*
Habitat: Lowlands to low mountainous areas at about 1000m a.s.l.

The sexes of this butterfly are similar except that the female is more robust. There is some argument on the status of the species. Otsuka (1988) treats it as *P. aristolochiae antiphus* whereas Page & Treadaway (1995) treat it as *P. antiphus*. The spread specimen tends to fade with time.
Species : *Chilasa slateri*
Food Plant : Lauraceae (*Cinnamomum* sp.)
Habitat : Low mountainous areas between 200 to about 1500m a.s.l. Forested hills and rarely occurs below 600m.

This species is easily distinguished by the dark brown above with a submarginal series of short whitish transverse streaks (sometimes spots), and small yellow tornal spot on the hindwing. This species is distributed in Northern India, Peninsula Malaysia, and Sumatra, and Borneo.
Great Blue Mime

Species: *Chilasa paradoxa*
Food Plant: *Lauraceae (Alseodaphne & Cinnamomum sp.)*
Habitat: Lowland to about 700m a.s.l.

*C. paradoxa* is never common, but is encountered in rather open forests. Most of them are a faithful copy of the danaids butterflies. Sometimes several individuals are taken together. North India to Sundaland.
**Lime Butterfly**

<table>
<thead>
<tr>
<th>Species</th>
<th><em>Papilio (Princeps) demoleus</em></th>
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<tbody>
<tr>
<td>Food Plant</td>
<td>Rutaceae (<em>Citrus</em> sp.), Rhamnaceae (<em>Ziziphus</em> sp.) &amp; Leguminosae (<em>Psoralea</em> sp.)</td>
</tr>
<tr>
<td>Habitat</td>
<td>Lowland to about 700m a.s.l. From urban area to forested area.</td>
</tr>
</tbody>
</table>

This butterfly is the most common among all the *Papilio*. Being found in villages and town garden. Nevertheless this species is quite rare in the forest and usually found singly. The larvae of this butterfly utilize most species of *Citrus* as the food plant.
# Banded Swallowtail

<table>
<thead>
<tr>
<th>Species</th>
<th><em>Papilio (Princeps) demolion</em></th>
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<tbody>
<tr>
<td>Food Plant</td>
<td><em>Aristolochiacea &amp; Rutaceae (Luvunga sp.)</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Well wooded localities at all elevations</td>
</tr>
</tbody>
</table>

Male. Wings black with a pale greenish macular band from the apex of the forewing to the mid dorsum of the hindwing. Hindwing with a long spatulate tail at vein 4. The larvae are gregarious and have been found feeding on food plant in Singapore.
Black & White Helen

Species: Papilio (Princeps) nephelus
Food Plant: Rutaceae (Zanthoxylum & Micromelum sp.)
Habitat: From 200-1000m a.s.l.

P. nephelus is common on the river banks, found bathing under the sun on the sunlit leaves. Usually found congregating on seepages of the river banks. A very fast flyer. Very common in Tabin, Danum Valley, Deramakot and Poring. The peculiar feature of this female is a yellowish white spot in forewing space 1a & 1b.
**Red Helen**

Species: *Papilio (Princeps) helenus*
Food Plant: *Rutaceae (Various species)*
Habitat: *Forest and forest fringes. From 200–1000m a.s.l.*

This species has 3 white spots on the upperside of the hindwing and has red spots in the inner margin of its underside. It is easily distinguished from *iswara* and *fuscus* by having the above features. *P. helenus* is common on a moderate elevation. Usually congregates with other butterflies such as *P. nephelus* and *Graphium*.
Species: *Papilio (Princeps) iswara*
Food Plant: **Unknown**
Habitat: **Low mountainous areas between 200 to about 1500m a.s.l.**

Largest among the similar species such as *helenus, fuscus* and so on. Both male and female have four white spots on hindwing in space 4 to 7.
The hindwing has two large black ocelli which are ringed with dark red on the tornal part.
This species prefers rather open forest country in the neighborhood of streams, and more on the hills than on the plains.
Species: *Papilio (Princeps) fuscus*
Food Plant: Unknown
Habitat: Low mountainous areas between 200 to about 1500m a.s.l.

The characteristic of this species is 5 white spots on the upperside and one white band on the underside of the hindwing. This species is widely distributed in the Peninsula Malaysia, Borneo, Sulawesi, New Guinea, and Australia. Now 22 subspecies are known from the world.
Common Mormon

Species: *Papilio (Princeps) polytes*
Food Plant: *Rutaceae (Various species)*
Habitat: Low mountainous area between 200 to about 1500m a.s.l.

Hindwing median white spots well developed and composed a prominent band. In female, adding to this morph, another type of morph appears. In which, orange red spots are developing to various degree on upper side of hindwing. Very widely distributed in Orient.
Species: *Papilio (Princeps) alphenor*
Food Plant: *Rutaceae (Citrus sp.)*
Habitat: Village at low elevation

This species has been known only from the Philippines for a long time. In 1998 this species was recorded from Semporena Is. for the first time. Now this species is recognized as a member of Bornean butterflies. It appears throughout the year.
Great Mormon

Species: *Papilio (Princeps) memnon*
Food Plant: *Rutaceae (Citrus sp.)*
Habitat: From lowland to 1000m a.s.l.

*Papilio memnon* is common in village and lowland forest. This species has no tail and no mark on the upperside of the wing. Well known for the mimicry by the females. There are six forms of females known in Sabah.

The distribution of this species is the Oriental region except for Philippines and Sulawesi.

Male, upperside

Male, underside
Species: *Papilio (Princeps) acheron*
Food Plant: *Rutaceae (Citrus sp.)*
Habitat: From lowland to 1000m a.s.l.

This species is very similar to the previous species, but differ from the following characters: hindwing with orange yellow band containing black spots on the undersurface; wing shape; colour pattern of red spots on the wing base of the undersurface.

Endemic to Borneo.
Karna Peacock

Species: *Papilio (Princeps) karna*
Food Plant: *Rutaceae (Euodia & Micromelum sp.)*
Habitat: Low mountain areas from 200-600m a.s.l.

This is one of the distinctive species in Borneo because of having a pair of blue marks on the uppersides.
One of Borneo's, many beautiful butterflies. Very common in Bunsit Park, Keningau, lately quite scarce, this may be due to the opening of the forest surrounding the area. The number dropped alarmingly. Usually found singly on wet seepages on the banks of the river. This species is distributed in Borneo, Sumatra, Java, and Palawan.
Banded Peacock

Species : *Papilio (Princeps) palinurus*
Food Plant : *Rutaceae (Clausena & Toddalia sp.)*
Habitat : Lowland to about 500m a.s.l.

This species is also one of the distinctive species in Borneo by having one green band on the uppersides.
It is smaller than *P. karna*. Usually found only in dense forest. Common at Danum Valley Field Centre. Nectaring on the flower of the Pagoda plant.
This species is distributed in Malaysia, Philippines and Palawan.
Common Bluebottle

Species : *Graphium (Graphium) sarpedon*
Food Plant : *Lauraceae (Various species)*
Habitat : From lowland to 1000m a.s.l.

*G. sarpedon* is the most common *Graphium* and could be found almost anywhere. This butterfly is considered as a minor pest to *Cinnomomum*. The large blue band tends to fade on spread specimen. This species flies very swiftly and difficult to catch flying individual. Widely distributed from Sri Lanka and India to China and Japan. Green-blue band running through center on both wings very clear.
Common Jay

Species: *Graphium (Graphium) doson*
Food Plant: Lauraceae & Annonaceae
Habitat: From lowland to 1000m a.s.l.

In the underside of the hindwing first basal black streak is not joined with second blackish bar, which has a red marking. This species is very widely distributed and reached Japan.
Species: *Graphium (Graphium) evemon*
Food Plant: *Lauraceae*
Habitat: From lowland to 1000m a.s.l.

The important character for identification is as follows:
On underside of the hindwing basal first two streaks are joined with each other and second bar lack red mark.
Species: *Graphium (Graphium) eurypylus*
Food Plant: *Lauraceae*
Habitat: From lowland to 1000m a.s.l.

This species has the following feature: On underside of the hindwing first basal black streak is joined with short second black bar, which has a red marking.
Kinabalu Bluebottle

Species: *Graphium (Graphium) procles*
Food Plant: *Lauraceae*
Habitat: Highland species. Occuring above 700m a.s.l.

This species can be easily distinguished from other *Graphium* members in having the combinations of the following characters: On underside of hindwing basal and second black streaks not united with each other; second streak lacking reddish marking. *G. procles* are large and endemic to Borneo, it frequents high elevation but sometimes also found on a lower elevation.
<table>
<thead>
<tr>
<th>Species</th>
<th><em>Graphium (Graphium) bathycles</em></th>
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<tbody>
<tr>
<td>Food Plant</td>
<td><em>Lauraceae</em></td>
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<tr>
<td>Habitat</td>
<td>From lowland to 1000m a.s.l.</td>
</tr>
</tbody>
</table>

This species has the independent first and second streaks on the undersides on the hindwings. The second streaks lack red marking and curve outwardly.
Tailed Jay

Species: *Graphium (Graphium) agamemnon*
Food Plant: *Annonaceae & Magnoliaceae*
Habitat: Lowland to low mountaineous area at about 700m a.s.l.

Easily found in forest road and village. Known to breed on *Annona*. This species has a distinctive characteristic of possessing the mottled pattern of apple colour both on upper and undersides. This species is very widely distributed in Asia and the Oriental region.
Kinabalu Swordtail

Species: *Pathysa (Pathysa) stratiotes*
Food Plant: *Annonaceae*
Habitat: Highland species. Occuring above 700m a.s.l.

This species has a pair of red marks on the inner margin of the wing. It is one of characteristic features among Bornean species. This species prefers high elevation and quite common in Kinabalu Park. It could also be found in the Crocker Range Park (Mahua Waterfall). Endemic to Borneo.
This species is similar to the preceding species, *P. stratiotes*, but is distinguishable from it by the color pattern on the underside and lacking red mark on the upperside. *P. antiphates* is quite common at any river and baited easily with rotting prawn.

This species is widely distributed in the Oriental region except for Philippines.
This species is very similar to *P. megarus* on the wing pattern, but the whitish parts of the upperside on the forewing are clearer than that of latter species. The marginal parts of this species are also black. This species has been widely recorded from the Oriental region, and a total of 11 subspecies are known in the area.

**Species**: *Pathysa (Paranticopsis) macareus*

**Food Plant**: Unknown

**Habitat**: Lowlands to low mountainous areas at about 500m a.s.l.
This species resembles *P. macareus* and *P. ramaceus*, but it is smaller than them and different from the wing patterns: whitish pattern of the cell on the forewings; comma-shaped whitish marks on the submarginal hindwings.

The distribution of this species is widespread in the North India, Peninsula Malaysia, Sumatra, and Borneo.
Pendlebury's Zebra

Species: *Pathysa (Paranticopsis) ramaceus*
Food Plant: Unknown
Habitat: Lowlands to low mountainous areas at about 500m a.s.l.

One of the characteristics in this species is the dark forewings without whitish pattern.
This species has been recorded from Sumatra, Peninsula Malaysia and Borneo.
Malayan Zebra

Species: *Pathysa (Paranticopsis) delessertii*
Food Plant: Magnoliaceae
Habitat: Lowlands to low mountainous areas at about 500m a.s.l.

A common species, easily recognized from other members of this family by the color pattern and a yellowish mark on the wing. This species easily baited with rotting prawn. It is usually found singly or in a congregation on a wet seepage of the river bank. It is said that this species is a mimic of *Ideopsis gaura* (Danaidae).

Its distribution is in Sundaland.
Species: *Lamproptera curius*
Food Plant: *Hernandiaceae (Illigera sp.)*
Habitat: Lowlands to low mountainous areas at about 500m a.s.l

*Lamproptera curius* and *L. meges* are unique in the tail of the wing. The difference between them is that this species has a pair of white distal bands with transparent outer margin.

This species is distributed from north India to Sundaland.
Green Dragontail

Species: Lamproptera meges
Food Plant: Hernandiaceae (Illigera sp.)
Habitat: Lowlands to low mountainous areas at about 500m a.s.l.

It is an uncommon species, and usually found singly. This species does not have the transparent part in the distal band, which is bluish or pale green. This coloration is also an important character for their identification.
This species is distributed from north India to Sundaland.
Further Reading


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Catalogue of Swallowtail Butterflies
(Lepidoptera: Papilionidae) at BORNEENSIS

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