

## Butterflies on offshore islands of Sabah, North Borneo, Malaysia (Lepidoptera: Rhopalocera)

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**Abstract:** On examining the butterflies most recently collected on the two small islands of the proposed Tun Sakaran Marine Park near Semporna, SE Sabah, Malaysia, a further new Nymphalidae taxon could be described: *Tanaecia pelea marnii* n. ssp. This new form is compared to related taxa and the male holotype (in Museum of the Universiti Malaysia Sarawak, Kota Samarahan) and female allotype specimens are figured. As an appendix a list of butterflies so far identified as occurring on Balambangan Island off NW Sabah, Malaysia, is provided.

**Key words:** Nymphalidae, *Tanaecia pelea marnii* n. ssp., Bohey Dulang, Bod Gaya Islands, Papilionidae, Pieridae, Lycaenidae, Hesperidae, Balambangan Island.

### Schmetterlinge auf küstennahen Inseln vor Sabah, Nordborneo, Malaysia (Lepidoptera: Rhopalocera)

**Zusammenfassung:** Die Bearbeitung der kürzlich gesammelten Schmetterlinge auf zwei kleinen Inseln des geplanten Tun-Sakaran-Meeresparks nahe Semporna, SE-Sabah, Malaysia, erbrachte ein weiteres neues Nymphaliden-Taxon, das in diesem Beitrag als *Tanaecia pelea marnii* n. ssp. beschrieben wird. Die neue Form wird mit verwandten Taxa verglichen, und Holotypus (♂, im Museum der Universiti Malaysia Sarawak, Kota Samarahan) und Allotypus (♀) werden abgebildet. In einem Anhang sind alle Rhopalocerenarten und -unterarten aufgelistet, die bislang auf der Insel Balambangan vor der Küste von NW-Sabah, Malaysia, gesammelt oder beobachtet worden sind.

### Introduction

In early July 2006 a short expedition to Bohey Dulang and Bod Gaya Islands was carried out by Sabah Park representatives together with Wahap MARNI, a member of the Universiti Malaysia. As a result of the expedition a good series of a new subspecies of *Tanaecia pelea* (FABRICIUS 1787) was discovered. Previous expeditions by M. LAKIM and S. DUNSUL in September and December 1998 had already demonstrated the importance of Lepidoptera from these islands and their relationship to the Lepidoptera of both N Borneo and the Sulu Archipelago, Philippines.

Further, based on expeditions by members of the Universiti Malaysia Sarawak made in 2001, 2003 to 2006 to Balambangan Island, N Sabah, the list of butterflies found on this island could be revised and brought up-to-date (ABANG et al. 2004, 2006, ABANG & PAGE 2006). The 2006 expedition was led by Prof. Dr. Fatimah ABANG and included Wahap MARNI and Audrie MENGAN together with Colin G. TREADAWAY, an honorary researcher, all from the University Malaysia, Sarawak, as well as Prof. Dr. Malcolm PAGE from Basel, Switzerland.

The proposed Tun Sakaran Park is located approximately 25 km to the NE of Semporna town, the closest town on mainland SE Sabah. This proposed (marine) park occupies 296 km<sup>2</sup> and includes a number of small islands such as Bohey Dulang and Bod Gaya (the two largest, both with forest), Tetagan, Maiga, Montabuan and Sibuan Islands. Balambangan Island is located approximately 5 km west of Banggi Island and is 21 km north of the northern tip of Sabah. This island is positioned between latitude 6° 10' N and 7° 25' N and longitude 116° 45' E and 117° 2' E. It is 20 km long with the highest elevation being 134 m.

### *Tanaecia pelea marnii* n. ssp.

**Holotype** ♂: Malaysia, SE Sabah, Bohey Dulang Is., 4. VII. 2006, W. MARNI leg. (Figs. 1, 2).

**Paratypes** (in total 6 ♂♂, 6 ♀♀): allotype ♀, same data as holotype (Figs. 3, 4). 6 ♂♂, 5 ♀♀ same data as holotype, but 1 ♂, 1 ♀ 3. VII., 1 ♀ 6. VII., 1 ♀ 7. VII. 2006. – 1 ♀, Malaysia, SE Sabah, Bod Gaya, 4. VII. 2006. All W. MARNI leg.

**Location of types:** The holotype and allotype are preserved in the Museum of the Universiti Malaysia Sarawak, Kota Samarahan; one pair of paratypes in the Sabah Parks Entomological Museum, Kinabalu Park. All other paratypes are in the Museum of the Universiti Malaysia Sarawak, Kota Samarahan.

**Etymology:** This new subspecies is named after Wahap MARNI who collected these specimens.

### Description

The species *Tanaecia pelea* (FABRICIUS 1787) occurs from Myanmar through Sumatra to Borneo and further to the Sulu Archipelago, Philippines. Subspecies *Tanaecia pelea lutala* (Moore 1859) is found over the whole of Borneo. No subspecies of *pelea* has been found on Balabac or Palawan. *Tanaecia pelea dohertyi* BUTLER 1901 is known from Jolo Island (TREADAWAY 1995: 32). The holotype ♀ of *T. pelea dohertyi* is located in the Natural History Museum London. It seems to be the only specimen of *dohertyi* known and is very different to the new subspecies in being very much lighter in appearance with the black markings of the forewing upperside being more a dirty light brown. However, the hindwing black markings are very visible on the light brown background. Additionally, the hindwing veins M<sub>3</sub>, Cu<sub>1a</sub>, and Cu<sub>1b</sub> on the upperside are broadly margined with black (Figs. 5, 6).

It is known that almost every small island off the west coast of Sumatra, as well as between the Malayan Peninsula/Sumatra to West Borneo, has developed its own *pelea* subspecies. The Bohey Dulang and Bod Gaya *T.*



Colour plate, Figs. 1–4: *Tanaecia pelea marnii* n. ssp., specimens from E Sabah, Bohey Dulang Is. Fig. 1: Holotype ♂, dorsal view. Fig. 2: ventral view. Fig. 3: Allotype ♀, dorsal view. Fig. 4: ventral view. — Figs. 5–6: *Tanaecia pelea doherlyi*. Fig. 5: Holotype ♀, dorsal view. Fig. 6: ventral view. Philippines, Sulu Archipelago, Jolo Island. — Photos C. G. TREADAWAY.

*pelea marnii* n. ssp. seems to be remarkably constant in appearance while the Bornean *T. pelea lutala* is quite variable. The new subspecies with an average forewing length of ♂ (n = 7) of 31 mm, ♀ (n = 7) of 35.1 mm differs from all forms of *lutala* in having a darker overall

appearance and larger and more heavily marked post-discal black arrow heads on the the upper- and underside of the fore- and hindwings. Further, the bright white discal patches of the forewing, cells  $M_3$  and  $Cu_{1a}$ , are larger and quadratic as compared to *lutala*. Interest-



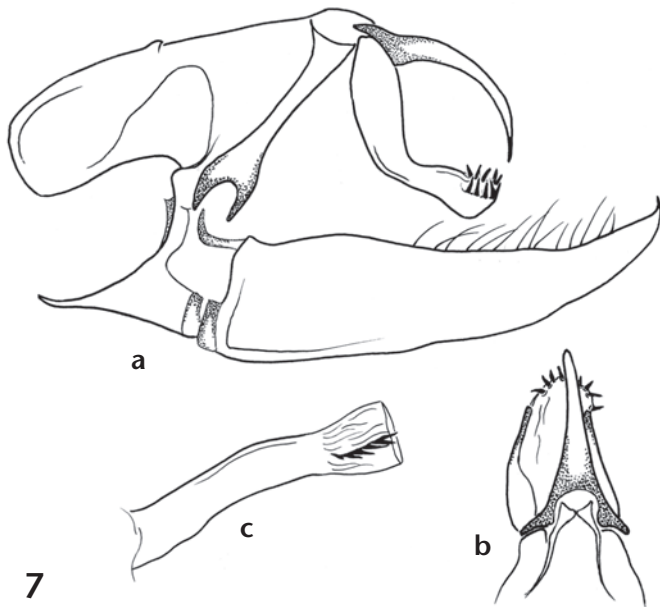


Fig. 7: *Tanaecia pelea marnii* n. ssp., ♂ genitalia (GP 479 SCHROEDER), E Sabah, Bohey Dulang Is. Fig. 7a: Lateral aspect; b: dorsal aspect of uncus and gnathos; c: phallus. — Drawings Inge SCHROEDER.

ingly, subspecies *T. pelea subiensis* TSUKADA 1991 from Subi Island, a small island in a chain of islands between West Borneo and Malaysia, is quite close in appearance to the new subspecies. However, it is even darker in overall appearance, with the postdiscal arrow heads being more brightly edged with white and with the base of the arrow heads blending into the dark brown marginal area. For the new subspecies, these arrow heads are distinctly broader and with a lighter marginal area. Further, the white patches on the forewing for the spaces associated with veins  $M_3$  and  $Cu_{1a}$  are, particularly basally, distinctly more quadrate. Both sexes are similarly marked, and for the underside, the base colour is a sandy brown (more so for the ♂) with all black markings of the upperside clearly visible on the underside.

♂ genitalia (Fig. 7): The ♂ genitalia of the new subspecies are clearly of the type belonging to the *pelea* group. The apex of the gnathos is edged with strong spines and the pointed end of the valva is furnished with a spine directed medial. Vesica of the phallus with a row of heavy spine-like cornuti.

### Remarks on the appendix table

From expeditions made to Balambangan in 2001 and 2003–2006 the appendix to this publication lists the butterfly species observed, collected and/or identified on Balambangan. The Borneo to Philippines subspecies distribution is shown as follows:

- 1 = Borneo,
- 2 = endemic to Balambangan  
only unless otherwise stated,
- 3 = Philippines.

In total 121 species have so far been found on Balambangan Island. Of the 121 species now known from Balambangan, 117 have been identified to subspecies level and

4 to species level only. Of the 117 species, 25.7 % of the subspecies occur on N Borneo and Balambangan, 21.5 % occur only on Balambangan or Balambangan and Banggi (ZAIDI & SALLAH 1997), 6.5 % occur on the Philippines and Balambangan and 46.3 % occur from N Borneo to the Philippines including Balambangan.

### Conclusion

Considering this publication and the publication by LAKIM et al. (2003) it can be concluded that Bohey Dulang and Bod Gaya Islands, just as Balambangan Island, provide a good opportunity for further research regarding the relationship of Lepidoptera to N Borneo and the Philippines, i.e. Balabac, Palawan and the Sulu Archipelago.

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### Appendix

**Appendix table:** List of butterflies of Balambangan Island prepared for the Universiti Malaysia Sarawak (effective July 2006). — Abbreviations for the distribution pattern see text.

Taxa	Distribution
<b>Papilionidae: Papilioninae (12 species)</b>	
<i>Graphium agamemnon agamemnon</i> (LINNAEUS 1758)	1, 3
<i>Arisbe doson sarpedonoides</i> ABANG & PAGE 2006	2 (+ Banggi)
<i>Arisbe antiphates simpulensis</i> ABANG & PAGE 2006	2
<i>Arisbe aristeus hermocrates</i> (FELDER & FELDER 1865)	1, 3
<i>Menelaides polytes theseus</i> (CRAMER 1779)	1
<i>Menelaides memnon memnon</i> (LINNAEUS 1758)	1, 3
<i>Menelaides hipponous jalandii</i> ABANG & PAGE 2006	2 (+ Banggi)
<i>Troides amphrysus flavicollis</i> DRUCE 1873	1
<i>Achillides palinurus</i> , probably ssp. <i>audryae</i> ABANG & PAGE 2006 (clearly observed by M. PAGE, but no specimens collected)	2 (+ Banggi)
<i>Graphium sarpedon</i> (LINNAEUS 1758)	1, 3
<i>Papilio demoleus</i> LINNAEUS 1758	1, 3
<i>Menelaides helenus</i> (LINNAEUS 1758)	1, 3
<b>Pieridae (13 species): Pierinae (9 species)</b>	
<i>Pareronia gulussa alpha</i> ABANG, TREADAWAY & SCHROEDER 2004	2
<i>Cepora iudith beta</i> ABANG, TREADAWAY & SCHROEDER 2004	2 (+ Banggi)
<i>Appias lycinda balambangensis</i> ABANG, TREADAWAY & SCHROEDER 2004	2 (+ Banggi)
<i>Appias paulina insularis</i> ABANG, TREADAWAY & SCHROEDER 2004	2
<i>Appias nephele dilutior</i> (STAUDINGER 1889)	3
<i>Appias albina albina</i> (BOISDUVAL 1836)	1, 3
<i>Appias olferna olferna</i> SWINHOE 1890	1
<i>Hebomoia glaucippe borneensis</i> (?) WALLACE 1863 (status still under investigation)	1 (?)
<i>Leptosia nina malayana</i> (?) FRUHSTORFER 1910 (status still under investigation)	1
<b>Pieridae: Coliadinae (4 species)</b>	
<i>Catopsilia pomona pomona</i> (FABRICIUS 1775)	1, 3
<i>Catopsilia pyranthe pyranthe</i> (LINNAEUS 1758)	1, 3
<i>Eurema hecabe hecabe</i> (LINNAEUS 1758)	1, 3
<i>Gandaca harina elis</i> FRUHSTORFER 1910	1
<b>Nymphalidae (46 species): Nymphalinae (24 species)</b>	
<i>Euthalia mahadeva ghazallyismaili</i> ABANG, TREADAWAY & SCHROEDER 2004	2 (+ Banggi)
<i>Dophla evelina magama</i> FRUHSTORFER 1913	1

Taxa	Distribution
<i>Bassarona teuta skrzypinskia</i> ABANG, TREADAWAY & SCHROEDER 2004	2 (+ Banggi)
<i>Doleschallia bisaltide borneensis</i> FRUHSTORFER 1899	1
<i>Hypolimnas bolina philippensis</i> BUTLER 1874	1, 3
<i>Hypolimnas anomala anomala</i> (WALLACE 1869)	1, 3
<i>Yoma sabina podium</i> TSUKADA 1985	3
<i>Lasippa tiga empat</i> TSUKADA & KANEKO 1985	1
<i>Cyrestis cocles sericeus</i> BUTLER 1865	1
<i>Neptis ilira cindia</i> ELIOT 1969	1
<i>Neptis hylas sopatra</i> FRUHSTORFER 1907	1, 3
<i>Neptis nata nata</i> MOORE 1858	1
<i>Neptis harita mingia</i> ELIOT 1969	1
<i>Pantoporia paraka paraka</i> (BUTLER 1879)	1
<i>Pantoporia hordonia dora</i> ELIOT 1969	1
<i>Athyma nefte subrata</i> MOORE 1858	1, 3
<i>Terinus clarissa bangueyana</i> FRUHSTORFER 1912	2 (+ Banggi)
<i>Cupha erymanthis erymanthis</i> (DRURY 1773)	1, 3
<i>Junonia orithya leucasia</i> (FRUHSTORFER 1912)	3
<i>Junonia almana almana</i> (LINNAEUS 1758) (recently recorded from N. Borneo)	1, 3
<i>Junonia hedonia ida</i> (CRAMER 1775)	1, 3
<i>Moduza procris agnata</i> (FRUHSTORFER 1896) (clearly observed by C. TREADAWAY, but no specimens collected)	1
<i>Parthenos sylvia borneensis</i> STAUDINGER 1889	1
<i>Lexias dirtea</i> (FABRICIUS 1793)	1, 3
<b>Nymphalidae: Charaxinae (3 species)</b>	
<i>Polyura schreiber balambangana</i> ABANG, TREADAWAY & SCHROEDER 2004	2
<i>Charaxes bernardus repetitus</i> BUTLER 1896	1
<i>Charaxes solon</i> possibly n. ssp. near <i>orchomenus</i> FRUHSTORFER 1914 (status still under investigation)	2 (?)
<b>Nymphalidae: Morphinae (Amathusiini) (2 species)</b>	
<i>Discophora necho epsilon</i> ABANG, TREADAWAY & SCHROEDER 2004	2 (+ Banggi)
<i>Amathusia phidippus phidippus</i> (LINNAEUS 1763)	1, 3
<b>Nymphalidae: Satyrinae (6 species)</b>	
<i>Elymnias panthera zeta</i> ABANG, TREADAWAY & SCHROEDER 2004	2
<i>Ragadia makuta umbrata</i> FRUHSTORFER 1911	1
<i>Lethe europa kayan</i> AOKI & UEMURA 1982	1
<i>Ypthima pandocus jamaeus</i> FRUHSTORFER 1911	2 (+ Banggi)
<i>Mycalasis mineus macromalaya</i> FRUHSTORFER 1911	1, 3
<i>Orsotriaena medus medus</i> (FABRICIUS 1775)	1, 3
<b>Nymphalidae: Danainae (11 species)</b>	
<i>Euploea midamus theta</i> ABANG, TREADAWAY & SCHROEDER 2004	2 (+ Banggi)
<i>Euploea swainson butra</i> STAUDINGER 1889	3
<i>Euploea mulciber</i> ssp. between <i>paupera</i> STAUDINGER 1889 and <i>portia</i> FRUHSTORFER 1904 (status still under investigation)	2 (?) (+ Banggi)
<i>Euploea tulliolus aristotelis</i> MOORE 1883	1, 3
<i>Euploea sylvester tyrianthina</i> MOORE 1883	1, 3
<i>Euploea eunice syra</i> FRUHSTORFER 1901	1, 3
<i>Idea leuconoe</i> n. ssp. SCHROEDER & TREADAWAY in prep.	2 (+ Banggi)
<i>Ideopsis vulgaris interposita</i> (FRUHSTORFER 1910)	1
<i>Ideopsis juvena kinitis</i> (FRUHSTORFER 1904)	1, 3
<i>Tirumala septentrionis suanetes</i> (FRUHSTORFER 1911)	3
<i>Danaus melanippus mezentius</i> (FRUHSTORFER 1910)	1, 3
<b>Lycaenidae (35 species): Miletinae (4 species)</b>	
<i>Miletus drucei metrovius</i> (FRUHSTORFER 1913)	1
<i>Miletus boisduvali boisduvali</i> MOORE 1858	1
<i>Logania marmorata hilaeira</i> FRUHSTORFER 1914	1, 3
<i>Allotinus subviolaceus subviolaceus</i> FELDER & FELDER 1865	1, 3
<b>Lycaenidae: Curetinae (1 species)</b>	
<i>Curetis tagalica labuana</i> EVANS 1954	1
<b>Lycaenidae: Lycaeninae (30 species)</b>	
<i>Flos apidanus palawanus</i> (STAUDINGER 1889)	3
<i>Drupadia rufotaenia</i> (FRUHSTORFER 1912) possibly n. ssp. (status still under investigation)	2 (?)
<i>Drupadia theda sigma</i> ABANG, TREADAWAY & SCHROEDER 2004	2
<i>Iraota rochana accius</i> SEITZ 1926	1
<i>Tajuria mantra mantra</i> (FELDER & FELDER 1860)	1, 3
<i>Remelana jangala khusus</i> ABANG, TREADAWAY, SCHROEDER & PAGE 2006	2
<i>Rachana jalindra menganae</i> ABANG, TREADAWAY, SCHROEDER & PAGE 2006	2
<i>Hypolycaena erylus aimnestus</i> FRUHSTORFER 1912	3

Taxa	Distribution
<i>Hypolycaena thecloides mortadai</i> ABANG, TREADAWAY, SCHROEDER & PAGE 2006	2 (+ Banggi)
<i>Bindahara phocides</i> possibly n. ssp. near <i>phocides</i> (FABRICIUS 1793) (status still under investigation)	2 (?)
<i>Euchrysops cnejus</i> (FABRICIUS 1798)	1, 3
<i>Lampides boeticus</i> (LINNAEUS 1767)	1, 3
<i>Jamides bochus nabonassar</i> (FRUHSTORFER 1916)	1, 3
<i>Jamides aratus adana</i> (DRUCE 1873)	1, 3
<i>Jamides callistus mioae</i> H. HAYASHI 1976	1, 3
<i>Jamides philatus amphyssina</i> (STAUDINGER 1889)	1, 3
<i>Jamides celeno lydanus</i> (FRUHSTORFER 1910)	3
<i>Nacaduba calauria malayica</i> CORBET 1938	1
<i>Nacaduba berenice akaba</i> (DRUCE 1873)	1, 3
<i>Nacaduba beroe neon</i> FRUHSTORFER 1916	1
<i>Caleta elna</i> probably ssp. <i>elvira</i> (FRUHSTORFER 1918) (status still under investigation)	1, 3
<i>Discolampa ethion icenus</i> (FRUHSTORFER 1918)	1
<i>Ionolyce helicon merguiana</i> (MOORE 1884)	1, 3
<i>Prosotas dubiosa subardates</i> (PIEPERS & SNELLEN 1918)	1, 3
<i>Prosotas nora superdates</i> (FRUHSTORFER 1916)	1, 3
<i>Catopyrops ancira almora</i> (DRUCE 1873)	1, 3
<i>Neopitheops zalmora zalmora</i> (BUTLER 1870)	1, 3
<i>Megisba malaya sikkima</i> MOORE 1884 (badly damaged specimen)	1, 3
<i>Chilades lajus athena</i> (FELDER & FELDER 1865)	1, 3
<i>Chilades mindora</i> (FELDER & FELDER 1865)	1, 3
<b>Hesperiidae (15 species): Coeliadinae (3 species)</b>	
<i>Bibasis oedipodea oedipodea</i> (SWAINSON 1820)	1, 3
<i>Hasora badra badra</i> (MOORE 1858)	1, 3
<i>Hasora taminatus malayana</i> (FELDER & FELDER 1860)	1, 3
<b>Hesperiidae: Hesperinae (12 species)</b>	
<i>Notocrypta clavata clavata</i> (STAUDINGER 1889)	1, 3
<i>Notocrypta paralyos chunda</i> FRUHSTORFER 1911	1, 3
<i>Quedara monteithi monteithi</i> (WOOD-MASON & DE NICÉVILLE 1887)	1
<i>Unkana ambasa batara</i> DISTANT 1886	1, 3
<i>Taractrocera luzonensis stella</i> EVANS 1934	1, 3
<i>Potanthus omaha maesina</i> (EVANS 1934)	1, 3
<i>Potanthus fetingi ahastina</i> (FRUHSTORFER 1911)	1
<i>Cephenes acalle kliana</i> EVANS 1934	1, 3
<i>Pelopidas agna agna</i> (MOORE 1866)	1, 3
<i>Pelopidas mathias mathias</i> (FABRICIUS 1798)	1, 3
<i>Borbo cinnara</i> (WALLACE 1866)	1, 3
<i>Oriens gola pseudolus</i> (Mabille 1883)	1, 3

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