

CHECKLIST ARTICLE

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A comprehensive checklist of butterflies (Insecta: Lepidoptera) with their status and habitat preference in Teknaf Wildlife Sanctuary, Bangladesh

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[20° 52' to 21° 09' N and 92° 08'
to 92° 18' E]

Abstract

Teknaf Wildlife Sanctuary (TWS) is a peninsular area in the southeast corner of Bangladesh bordered by the Naf River from Myanmar in the east and bounded by the Bay of Bengal from the west and the south. A study on butterflies of TWS was conducted between March 2014 and June 2016 to make a comprehensive checklist, and to know their status and habitat preference. One hundred thirty-four species of butterflies belong of 86 genera and 6 families were enlisted, of which, 123 species were observed during this study and 11 species listed from previous report. Family Nymphalidae comprised the highest number of species (45 i.e., 36.6%) followed by 33 Lycaenidae (24.6%), 32 Hesperidae (23.9%), 12 Pieridae (9%), 11 Papilionidae (8.2%) and 1 Riodinidae (0.75%). The status of observed butterflies (123 species) was assessed as Very Common (34 species), Common (35 species), Uncommon (29 species) and Rare (25 species). TWS supports different types of habitat for butterflies such as, Homestead Gardens, Grass Lands, Crop Lands, Open Forests, Scrub Forests, Dense Forests and Bamboo Patches. Mud Puddling habits of 36 species were observed.

Keywords: distribution, diversity, entomology, insects, Myanmar border, protected area, Southeast Bangladesh

Introduction

Butterflies are very fascinating flying insects and essential model species of ecology and evolutionary studies. There are about 19000 (19,238) species of butterflies in the world (Heppner, 1998) and 305 species were listed from Bangladesh (IUCN Bangladesh, 2015) which may exceed up to 400 (Chowdhury & Hossain 2013).

Only handful of studies has been conducted on butterflies of Teknaf Peninsula. During working on butterflies of Arakan coast in the British colonial period, Gladman (1947) and Emmet (1948) recorded butterflies of Teknaf. Larsen (2004) also searched butterflies in Teknaf during the compiling a list of butterflies of Bangladesh. Nabi (2013) mentioned that there are 70 species of butterfly in the Teknaf Wildlife Sanctuary (TWS) but he did not provide any comprehensive list. There is no systematic checklist of butterflies of TWS. In this article we provide a comprehensive checklist with their status, and the habitat preference by different butterfly species as a result of survey on butterflies of the TWS.

TWS is a peninsular landmass in the southeast corner of Bangladesh (20° 52' to 21° 09' N and 92° 08' to 92° 18' E) is surrounded by the Naf River and Myanmar border in the east, plain lands of Teknaf peninsula in the south, the Bay of Bengal in the west and Inani Reserve Forest in the north (Figure. 1). This sanctuary comprised 10 Forest Beats under three Forest Ranges of Cox's Bazar South Forest Division. It is a hilly mixed-evergreen sub-tropical forest with secondary vegetation. It covers an area of 11,615 ha with a length of about 32 km (north-south) and width varies 3 to 5 km. The highest altitude in TWS is about 284 m (800 ft) asl at Toingya of Shilkhali Forest Range. There are crop lands, homestead vegetations, salt fields and aquaculture lands in and around the sanctuary. There are 149 streams originated from TWS and flowing down to the Naf River at the east and to the Bay of Bengal at the west (Feeroz 2013). The area of TWS comprises a moist sub-tropical maritime climate with three distinct seasons: Spring (March to April), Monsoon (May to October) and Winter (November to February) (Bari & Dutta 2004). The rainfall of Teknaf area is frequent and heavy during the monsoon (range from 130 to 940 mm), temperature varies from 15° to 32°C, and humidity ranges from 27 to 99% (BBS 2011). The sanctuary is very rich in flora and represents different ecosystems including hill forest, mangrove formation and sand-dune (Uddin et al. 2013). Feeroz (2013) recorded 538 plant species from the TWS.

Methods

Data Collection: The study was conducted in TWS from March 2014 to June 2016. Field work was carried throughout the day covering all seasons while emphasis was given on sunny bright periods of the day and summer season of the year (when butterflies are more active than other times). Nine transects were establish to search butterflies through existing roads, trails, streams and bridle paths which are leading into the forest. The numbers of encounter for each species of butterfly were recorded during the survey. Previously reported butterfly species from TWS were also included in the checklist. The habitats of butterflies were also noted down during the study as Homestead Garden (HG), Grass Land (GL), Crop Land (CL), Open Forest (OF), Scrub

Forest (SF), Dense Forest (DF) and Bamboo Patch (BP). Particular attentions were given to observe the Mud Puddling (MP) of butterfly species.

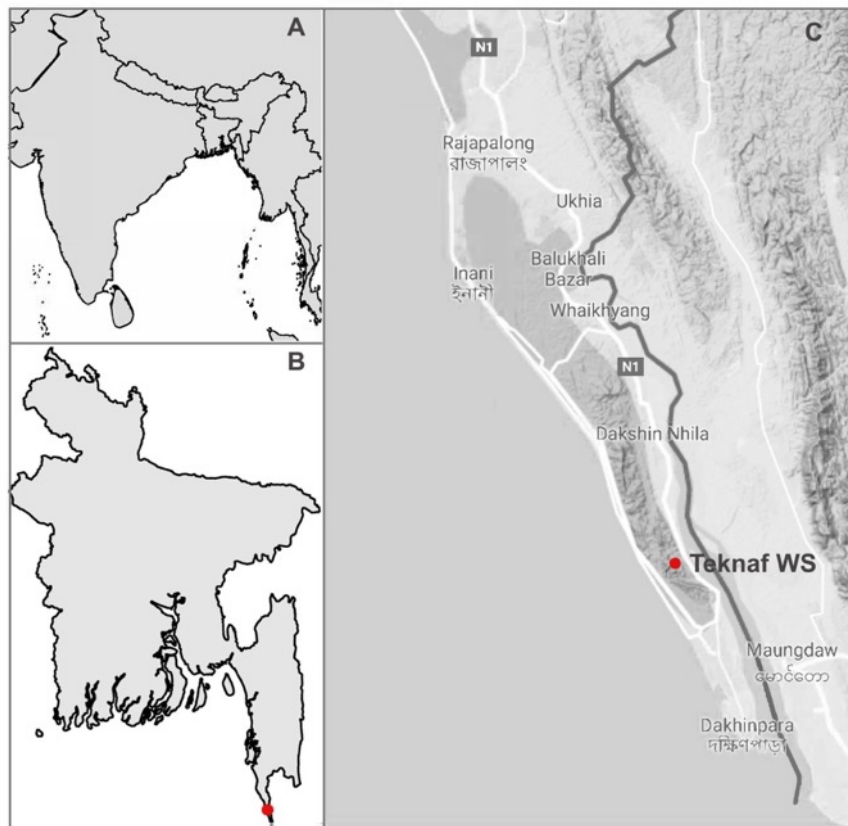


Figure 1. A. Location of Bangladesh in South Asia. B. Location of the study area in Bangladesh. C. Study area, Teknaf Wildlife Sanctuary (Map data sources: A and B – mapdata R package, C – Google terrain)

Species Identification and data analysis: Butterflies were identified primarily using field guides (e.g., Chowdhury and Hossain 2013; Kehimkar 2013) during the field study. Confusing specimens were photographed using a camera (Canon EOS 600D with 75-300 mm IS II lens) and identified following the keys developed by Marshall and de Niceville (1883), Bingham (1905), Evans (1932), Ameen and Choudhury (1968) and Bashar (2014). In some cases, photographs were compared with the database of following web resources: <http://www.ifoundbutterflies.org/>; <http://flutters.org/> and <http://yutaka.it-n.jp/>.

The status of butterflies was determined on the basis of total encounter during field study and grouped into four categories. Those species of butterflies which were encountered more than 75% times categorized as Very Common (VC); 51-75% as Common (C); 26-50% Uncommon (UC) and less than 25% were as Rare (R). Families, generic names, and species names in the checklist list of butterflies were arranged in the alphabetical order.

Results

A total of 134 species of butterflies belongs to 86 genera and six families (Figure 2) were recorded from the TWS. Among them, 123 species were observed during the study period and other 11 species were included in the list from the previous records of Teknaf to make a comprehensive checklist. These species were Scarce Blue Tiger *Tirumala gautama* and Sullied Sailer *Neptis soma* were recorded by Gladman (1947); Indian Oakblue *Arhopala atrax* and Common Onyx *Horaga onyx* by Emmet (1948); Rice Swift *Borbo cinnara*, Eastern Common Tiger *Danaus melanippus* and Burma Tree Nymph *Idea agamarschana* by Larsen (2004); and White-bar Bushbrown *Mycalesis anaxias*, Perak Lascar *Pantoporia paraka* Blue Mormon *Papilio polymnestor* and Common Jezebel *Delias eucharis* by Nabi (2013). Literature survey reveals that, 57 species of butterfly were previously recorded from the study area (Appendix I) and 77 species have been recorded for the first time from TWS.

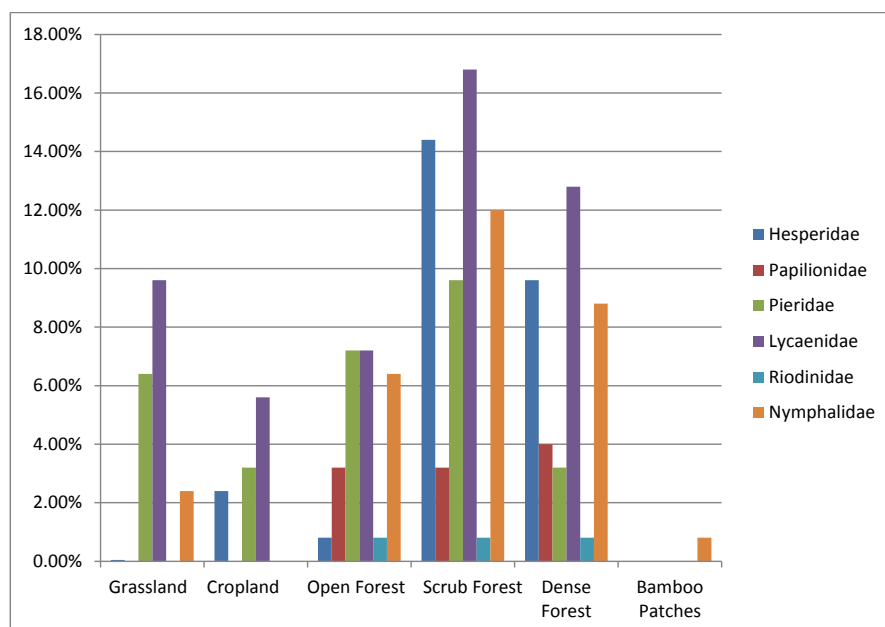


Figure 2. Types of habitats preferred by different butterfly families

Most of the recorded species from TWS belong to the Family Nymphalidae (45 i.e., 33.6%) while only one species to the Riodinidae (0.75%) (Table 1).

According to IUCN Bangladesh (2015), 51 (38%) of total recorded species are threatened (36 Vulnerable and 15 Endangered) and 69 species (51.5%) are Least Concern in Bangladesh. The rest 14 species (10.5%) are still not included in the red list of the country (Appendix I).

Of the recorded species during the field study (123 species), 34 (27.6%) were Very Common, 35 (28.5%) were Common, 29 (23.6%) were Uncommon and 25 (20.3%) were Rare. Most of the Very Common species were Nymphalidae butterflies (16 i.e., 47.1%). Nymphalids were also the most frequent among the Common species (12 i.e., 34.3%) (Table 1). The highest

number of Uncommon and Rare species belonged to Hesperidae (10 i.e., 34.5% and 11 i.e., 44% respectively) (Table 1).

Family-wise study has been revealed that, among the observed species during this study (123 species), 35 (28.45%) used all kinds of habitat (AH) and most of them were nymphalid butterflies (22). Besides them, 78 species preferred to use multiple habitats, of which five types of habitat were chosen by 3 species, four types by 15 species, three types by 33 species and two types by 27 species (Appendix I). The rest (10 species) of the observed species preferred single habitat: 7 chose DF; and 3 SF (Appendix I).

Mud Puddling habit of 36 (29.3%) species were also observed (Appendix II), these species belonged to 5 families except Riodinidae. The highest number of species (15 i.e., 41.7%) belongs to the Family Lycaenidae followed by Papiolinidae (7 i.e., 19.4%), Pieridae (6 i.e., 16.7%), Nymphalidae (5 i.e., 13.9%) and the lowest number belongs to the Hesperidae (3 i.e., 8.3%).

Table 1: Status of butterflies in Teknaf Wildlife Sanctuary

SL. No.	Family	Very Common	Common	Uncommon	Rare	Number of species
1	Hesperidae	3 (8.82%)	7 (25.71%)	10 (34.48%)	11 (44.00%)	31 (25.20%)
2	Lycaenidae	7 (20.59%)	9 (25.71%)	9 (31.03%)	6 (24.00%)	31 (25.20%)
3	Nymphalidae	16 (47.06%)	12 (34.29%)	6 (20.69%)	5 (20.00%)	39 (31.71%)
4	Papilionidae	3 (8.82%)	4 (11.43%)	2 (6.90%)	1 (4.00%)	10 (8.13%)
5	Pieridae	4 (11.76)	3 (8.57%)	2 (6.90%)	2 (8.00%)	11 (8.94%)
6	Riodinidae	1 (2.94%)	-	-	-	1 (0.81%)
Total		34 (100%)	35 (100%)	29 (100%)	25 (100%)	123 (100%)

Discussion

The TWS is a hilly mixed evergreen tropical forested area which supports the different types of habitat for butterflies namely, Homestead Garden (HG), Grass Land (GL), Crop Land (CL), Open Forest (OF), Scrub Forest (SF), Dense Forest (DF), Bamboo Patch (BP) and hill streams for mud puddling (MP) (Figure. 2). Among these habitats, forested areas are very important habitats for butterflies: 106 species visit scrub forest, 84 species dense forest and 74 species open forest. Grasslands and homestead gardens are also important habitats where respectively 65 and 63 species were recorded. The occurrence of butterflies in the TWS is also largely related to the nature of habitat choice by species. According to IUCN Bangladesh (2015) 15 Endangered and 36 Vulnerable species of butterflies were recorded from TWS, of which, the distribution of eight Endangered and nine Vulnerable species were restricted to forested areas

(OF, SF and/or DF) (Appendix I), these species as well as their habitats need conservation priorities. Among the previously recorded butterflies of TWS (57 species), we did not encounter 11 species during the current study period and even 4 species of them (Scarce Blue Tiger *Tirumala Gautama* and Sullied Sailer *Neptis soma* recorded by Gladman 1947; and Indian Oakblue *Arhopala atrax* and Common Onyx *Horaga onyx* by Emmet 1948) have not been reported from the study area since 1948. Most of the nymphalid butterflies (28 species i.e. 62.2%) were determined as either very common or common in the TWS and they inhabit maximum types of habitats. Conversely, most of the Hesperid butterflies (21 species i.e. 65.6%) were assessed as uncommon or rare and most of them were confined in one or two types of habitats. This result indicates that the habitat heterogeneity maintains diversity of butterflies and study of habitat use by species is essential for their conservation.

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Appendix I: List of butterflies of the Teknaf Wildlife Sanctuary (TWS) with their status and habitat

Numerically marked species were previously reported from TWS by ¹Gladman (1947), ²Emmet (1948), ³Larsen (2004) and ⁴Nabi (2013).

*VC= Very Common, C-Common, UC-Uncommon, R-Rare

**AH-All Habitat, HG-Homestead Garden, GL-Grassland, CL-Cropland, OF-Open Forest, SF-Scrub Forest, DF-Dense Forest, BP-Bamboo Patch, MP-Mud Puddles

***LC-Least Concern. VU-Vulnerable, EN-Endangered

Sl. No.	Scientific name	Common Name	Status* (TWS)	Habitat Preference**	Country Status***
Family: Hesperidae					
1	<i>Ampittia dioscorides</i> Fabricius, 1793	Bush Hopper	R	GL, CL	
2	<i>Ancistroides nigrita</i> Latreille, 1824	Chocolate Demon	C	HG, SF, DF	
3	<i>Badamia exclamationis</i> Fabricius, 1775	Brown Awl	R	SF, DF	VU

4	<i>Baoris farri</i> Moore, 1878	² Paintbrush Swift	UC	SF, DF	
5	<i>Borbo cinnara</i> Wallace, 1866	³ Rice Swift			LC
6	<i>Celaenorrhinus leucocera</i> Kollar, 1848	Common Spotted Flat	R	OF, SF	EN
7	<i>Cephrenes chrysozona</i> Mabille, 1904	Plain Palm Dart	R	HG, GL, OF, SF	
8	<i>Cupitha purreea</i> Moore, 1977	Wax Dart	R	SF, DF	EN
9	<i>Gangara thyrasis</i> Fabricius, 1775	Giant Redeye	UC	HG, SF, DF	VU
10	<i>Hasora badra</i> Moore, 1857	Common Awl	R	DF, MP	VU
11	<i>Hyarotis adrastus</i> Moore, 1865	Tree Flitter	UC	HG, OF, SF, DF	VU
12	<i>Iambrix salsala</i> Moore, 1865	Chestnut Bob	VC	AH	LC
13	<i>Koruthaialos butleri</i> de Nicéville, 1883	Dark Velvet Bob	R	SF, DF	
14	<i>Matapa aria</i> Moore, 1865	Common Redeye	C	HG, OF, SF, DF	LC
15	<i>Matapa sasivarna</i> Moore, 1865	Black-veined Redeye	UC	DF	VU
16	<i>Notocrypta feisthameli</i> Moore, 1865	Spotted Demon	R	SF, DF, MP	
17	<i>Notocrypta paralysos</i> Fruhstorfer, 1911	Common Banded Demon	UC	SF, DF, MP	LC
18	<i>Odontoptilum angulata</i> Felder, 1862	¹ Chestnut Angle	R	DF	LC
19	<i>Oriens gola</i> Mabille, 1883	Common Dartlet	C	SF	LC
20	<i>Parnara guttatus</i> Moore, 1865	Straight Swift	VC	HG, SF	LC
21	<i>Pelopidas agna</i> Moore, 1865	³ Bengal Swift	UC	SF	LC

22	<i>Pelopidas mathias</i> Fabricius, 1798	Small Branded Swift	C	HG, GL, SF	VU
23	<i>Pseudocoladenia dan</i> Evans, 1949	Fulvous Pied Flat	R	OF, SF, DF	EN
24	<i>Sancus fuligo</i> Moore, 1878	Coon	C	HG, OF, SF, DF	EN
25	<i>Sarangesa dasahara</i> Moore, 1865	Common Small Flat	UC	HG, OF, SF	VU
26	<i>Suastus gremius</i> Fabricius, 1798	Indian Palm Bob	UC	OF, SF, DF	EN
27	<i>Tagiades japetus</i> Moore, 1865	Common Snow Flat	VC	HG, OF, SF	VU
28	<i>Taractrocera maeivius</i> Fabricius, 1793	Common Grass Dart	UC	GL, CL	
29	<i>Telicota bambusae</i> Moore, 1878	Dark Palm dart	C	HG, GL, CL, OF, SF	VU
30	<i>Telicota colon</i> Fabricius, 1775	³ Pale Palm Dart	C	HG, GL, CL, SF	
31	<i>Udaspes folus</i> Cramer, 1775	Grass Demon	UC	HG, GL, SF, DF	LC
32	<i>Unkana ambasa</i> Moore, 1858	Hoary Palmer	R	HG, OF, SF	
Family: Lycaenidae					
33	<i>Amblypodia anita</i> Hewitson, 1862	² Purple Leaf Blue	R	DF, MP	EN
34	<i>Anthene emolus</i> Godart, 1823	Common Ciliate Blue	VC	HG, OF, SF, DF, MP	VU
35	<i>Anthene Lycaenina</i> Hewitson, 1878	Pointed Ciliate Blue	C	AH, MP	EN
36	<i>Arhopala agaba</i> Hewitson, 1862	Purple-glazed Oakblue	UC	GL, SF	
37	<i>Arhopala atrax</i> Hewitson, 1867	² Indian Oakblue			
38	<i>Arhopala centaurus</i> Moore, 1883	Centaur Oakblue	UC	SF, DF	LC

39	<i>Arhopala eumolphus</i> Cramer, 1780	² Green Oakblue	UC	SF, DF	VU
40	<i>Castalius rosimon</i> Fabricius, 1775	³ Common Pierrot	VC	AH	LC
41	<i>Catochrysops strabo</i> Fabricius, 1793	Forget-me-not	C	AH, MP	VU
42	<i>Chilades lajus</i> Stoll, 1870	Lime Blue	C	HG, GL, CL, SF, MP	LC
43	<i>Curetis thetis</i> Drury, 1773	Indian Sunbeam	R	HG, SF, DF	LC
44	<i>Discolampa ethion</i> Westwood, 1851	Banded Blue Pierrot	UC	GL, OF, SF, MP	VU
45	<i>Euchrysops cnejus</i> (Fabricius, 1798)	Gram Blue	C	GL, CL, OF, SF	LC
46	<i>Horaga onyx</i> Moore, 1858	² Common Onyx			
47	<i>Hypolycaena erylus</i> Godart, 1824	⁴ Common Tit	VC	HG, SF, DF, MP	VU
48	<i>Jamides alecto</i> Fruhstorfer, 1916	Metallic Cerulean	R	DF, MP	LC
49	<i>Jamides bochus</i> Stoll, 1782	Dark Cerulean	C	SF, DF, MP	VU
50	<i>Jamides celeno</i> , (Cramer, 1775)	Common Cerulean	VC	AH, MP	LC
51	<i>Jamides pura</i> Moore, 1886	White Cerulean	R	SF	EN
52	<i>Lampides boeticus</i> Linné, 1767	Pea Blue	UC	GL, CL, OF	LC
53	<i>Loxura atymnus</i> Fruhstorfer, 1912	Yamfly	VC	AH, MP	VU
54	<i>Neopithecops zalmora</i> (Butler, 1870)	Quaker	VC	AH, MP	LC
55	<i>Prosotas dubiosa</i> Evans, 1925	Tailless Lineblue	UC	GL, OF, SF, MP	VU
56	<i>Prosotas nora</i> Moore, 1875	Common Lineblue	VC	AH, MP	LC
57	<i>Pseudozizeeria maha</i> Kollar, 1848	Pale Grass Blue	UC	GL, CL	LC

58	<i>Rapala manea</i> Hewitson, 1863	Slate Flash	C	HG, SF, DF	LC
59	<i>Rapala pheretima</i> Hewitson, 1863	Copper Flash	R	SF, DF	VU
60	<i>Spindasis lohita</i> Moore, 1884	Long-banded Silverline	UC	HG, GL, SF	VU
61	<i>Spindasis syama</i> Horsfield, 1829	Club Silverline	C	GL, OF, SF, DF, MP	VU
62	<i>Surendra quercetorum</i> Moore, 1857	Common Acacia Blue	UC	SF, DF	EN
63	<i>Zizeeria karsandra</i> Moore, 1865	Dark Grass Blue	C	GL, CL, OF	LC
64	<i>Zizina otis</i> Fabricius, 1787	Lesser Grass Blue	C	GL, CL	LC
65	<i>Zizula hylax</i> Fabricius, 1775	³ Tiny Grass Blue	R	GL, CL	LC
Family: Nymphalidae					
66	<i>Acraea violae</i> Fabricius, 1775	Tawny Coster	R	OF, SF, DF	LC
67	<i>Ariadne Ariadne</i> Fruhstorfer, 1899	³ Angled Castor	C	AH	LC
68	<i>Ariadne merione</i> Moore, 1884	³ Common Castor	VC	AH	LC
69	<i>Athyma inara</i> Westwood, 1850	Colour Sergeant	UC	OF, SF, DF	VU
70	<i>Athyma perius</i> (Linnaeus, 1758)	Common Sergeant	C	GL, OF, SF, DF	LC
71	<i>Cethosia cyane</i> Drury, 1773	⁴ Leopard Lacewing	UC	OF, SF, DF	LC
72	<i>Cupha erymanthis</i> Sulzer, 1776	Rustic	VC	SF, DF	LC
73	<i>Danaus Chrysippus</i> Linnaeus, 1758	³ Plain Tiger	VC	AH	LC
74	<i>Danaus genutia</i> Cramer 1779	^{3,4} Common Tiger	VC	AH	LC
75	<i>Danaus melanippus</i> Fruhstorfer, 1899	³ Eastern Common Tiger			EN

76	<i>Elymnias hypermnestra</i> Drury, 1773	³ Common Palmfly	VC	AH	LC
77	<i>Euploea algea</i> Westwood, 1848	³ Long-branded Blue Crow	R	DF, MP	EN
78	<i>Euploea core</i> Cramer, 1780	³ Common Crow	VC	AH, MP	LC
79	<i>Euploea klugii</i> Moore, 1857	King Crow	R	SF, DF, MP	VU
80	<i>Euploea mulciber</i> (Cramer, 1777)	Striped Blue Crow	UC	SF, DF, MP	VU
81	<i>Euthalia aconthea</i> Moore, 1857	Common Baron	C	AH	LC
82	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	^{3,4} Great Eggfly	C	AH, MP	LC
83	<i>Idea agamarschana</i> Fruhstorfer, 1910	³ Burma Tree Nymph			VU
84	<i>Junonia almana</i> (Linnaeus, 1758)	^{3,4} Peacock Pansy	VC	AH	LC
85	<i>Junonia atlites</i> Linnaeus, 1763	^{3,4} Grey Pansy	VC	AH	LC
86	<i>Junonia hierta</i> (Fabricius, 1798)	^{3,4} Yellow Pansy	VC	AH	LC
87	<i>Junonia iphita</i> (Cramer, 1779)	Chocolate Pansy	VC	AH	LC
88	<i>Junonia lemonias</i> (Linnaeus, 1758)	^{3,4} Lemon Pansy	VC	AH	LC
89	<i>Lebadea martha</i> Fabricius, 1787	⁴ Knight	VC	OF, SF, DF	VU
90	<i>Melanitis leda</i> Linnaeus, 1758	³ Common Evening Brown	VC	AH	LC
91	<i>Moduza procris</i> (Cramer, 1777)	⁴ Commander	C	OF, SF, DF	LC
92	<i>Mycalesis anaxias</i> Fruhstorfer, 1911	⁴ White-bar Bushbrown			EN
93	<i>Mycalesis mineus</i> (Linnaeus, 1758)	Dark Branded Bushbrown	C	GL, OF, SF, BP	LC
94	<i>Mycalesis perseus</i> Fabricius, 1798	Common Bushbrown	VC	AH	VU

95	<i>Neptis clinia</i> Moore, 1872	¹ Clear Sailer	C	GL, OF, SF	VU
96	<i>Neptis hylas</i> Moore, 1758	³ Common Sailer	VC	AH	LC
97	<i>Neptis jumbah</i> Moore, 1857	Chestnut-streaked Sailer	UC	OF, SF	LC
98	<i>Neptis soma</i> Moore, 1858	¹ Sullied Sailer			VU
99	<i>Orsotriaena medus</i> Fabricius, 1775	⁴ Nigger	UC	OF, SF	VU
100	<i>Pantoporia hordonia</i> Stoll, 1790	Common Lascar	C	AH	VU
101	<i>Pantoporia paraka</i> Butler, 1879	⁴ Perak Lascar			EN
102	<i>Parantica aglea</i> (Stoll, 1782)	² Glassy Tiger	C	SF, DF	VU
103	<i>Parthenos Sylvia</i> Fabricius, 1787	¹ Clipper	R	HG, SF, DF	VU
104	<i>Phalanta phalantha</i> (Drury, 1770)	⁴ Common Leopard	C	AH	LC
105	<i>Tanaecia lepidea</i> Butler, 1868	Grey Count	C	HG, OF, SF	VU
106	<i>Tirumala gautama</i> Moore, 1877	¹ Scarce Blue Tiger			
107	<i>Tirumala limniace</i> Gmelin, 1790	⁴ Common Blue Tiger	UC	AH	LC
108	<i>Ypthima baldus</i> (Fabricius, 1775)	⁴ Common Fivering	VC	AH	VU
109	<i>Ypthima huebneri</i> Kirby, 1871	Common Furring	C	AH	LC
110	<i>Ypthima inica</i> Hewitson, 1864	⁴ Lesser Threering	R	AH	EN

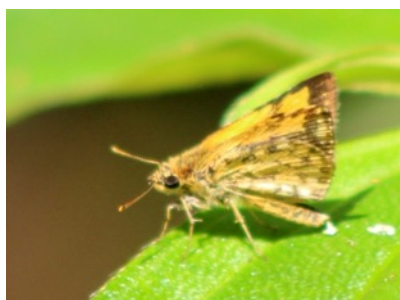
Family: Papilionidae

111	<i>Chilasa clytia</i> (Linnaeus, 1758)	³ Common Mime	C	OF, SF, MP	LC
112	<i>Losaria coon</i> Butler, 1885	Common Clubtail	R	SF, DF	
113	<i>Pachliopta aristolochiae</i> Fabricius, 1775	³ Common Rose	C	AH, MP	LC
114	<i>Pachliopta hector</i> Linné, 1758	^{3,4} Crimson Rose	UC	HG, GL, CL, OF, SF	EN
115	<i>Papilio chaon</i> Westwood, 1845	Yellow Helen	C	AH, MP	LC

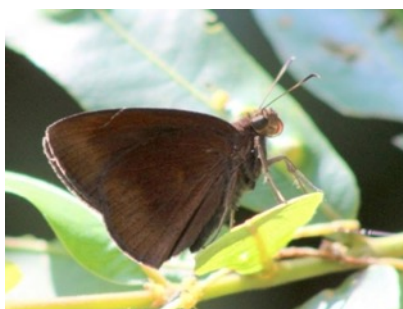
116	<i>Papilio demoleus</i> (Linnaeus, 1758)	³ Citrus Butterfly	VC	AH, MP	LC
117	<i>Papilio helenus</i> Linné, 1758	^{2,4} Red Helen	UC	SF, DF, MP	VU
118	<i>Papilio memnon</i> Linnaeus, 1758	Great Mormon	VC	OF, SF, DF, MP	LC
119	<i>Papilio polymnestor</i> Cramer, 1775	⁴ Blue Mormon			LC
120	<i>Papilio polytes</i> Cramer, 1775	^{3,4} Common Mormon	VC	AH, MP	LC
121	<i>Troides helena</i> Linnaeus, 1758	Common Birdwing	C	OF, SF, DF	VU
Family: Pieridae					
123	<i>Appias lyncida</i> (Boisduval, 1836)	Chocolate Albatross	UC	GL, OF, SF, MP	LC
122	<i>Appias olferna</i> Swinhoe, 1890	³ Striped Albatross	C	GL, CL, OF, SF, MP	LC
124	<i>Catopsilia pomona</i> Fabricius, 1775	Common Emigrant	VC	AH, MP	LC
125	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	³ Mottled Emigrant	UC	HG, GL, SF, MP	LC
126	<i>Delias descombesi</i> (Boisduval, 1836)	Red-spot Jezebel	VC	HG, CL, OF, SF, DF	LC
127	<i>Delias eucharis</i> Drury, 1773	⁴ Common Jezebel			LC
128	<i>Delias hyparete</i> Wallace, 1867	^{3,4} Painted Jezebel	VC	HG, OF, SF, DF	LC
129	<i>Delias pasithoe</i> Linnaeus, 1767	Red-base Jezebel	R	OF, SF, DF	LC
130	<i>Eurema andersoni</i> Corbet & Pendlebury, 1932	One-Spot Grass Yellow	R	GL, SF	LC
131	<i>Eurema blanda</i> (Wallace, 1867)	³ Three-Spot Grass Yellow	C	GL, OF, SF, MP	LC
132	<i>Eurema hecabe</i> Linnaeus, 1758	³ Common Grass Yellow	VC	HG, GL, CL, MP	LC

133	<i>Leptosia nina</i> Fabricius, 1793	Psyche	C	HG, GL, CL	LC
Family: Riodinidae					
134	<i>Zemeros flegyas</i> Cramer, 1780	⁴ Punchinello	VC	OF, SF, DF	LC

Appendix II: Photographs of the list of butterflies of Teknaf Wildlife Sanctuary (TWS)



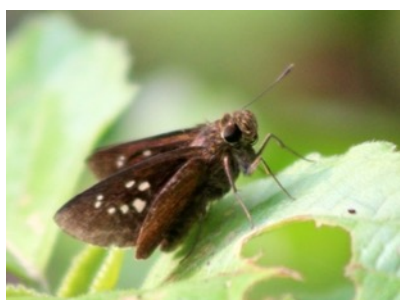
Ampittia dioscorides Fabricius, 1793



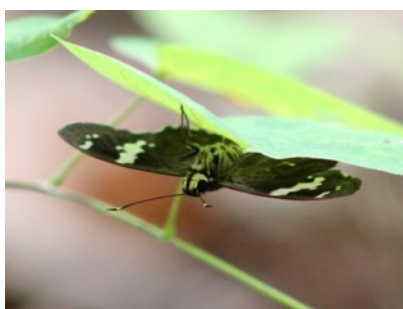
Ancistroides nigrita Latreille, 1824



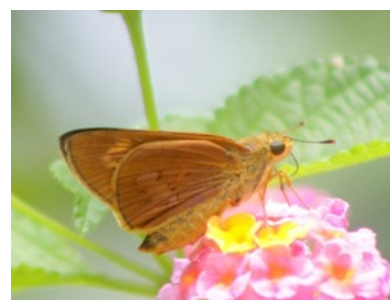
Badamia exclamationis Fabricius, 1775



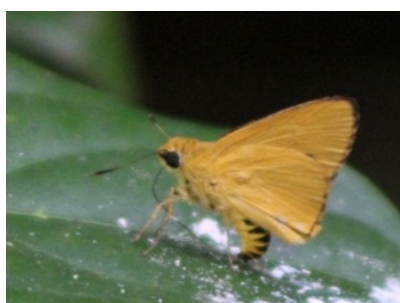
Baoris farri Moore, 1878



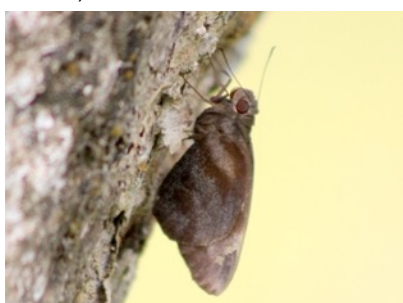
Celaenorrhinus leucocera Kollar, 1848



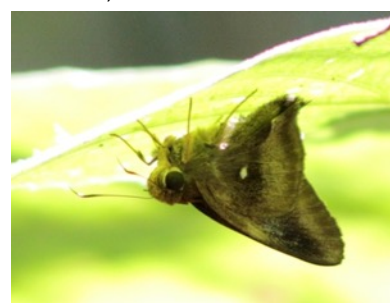
Cephrenes chrysozona Mabilie, 1904



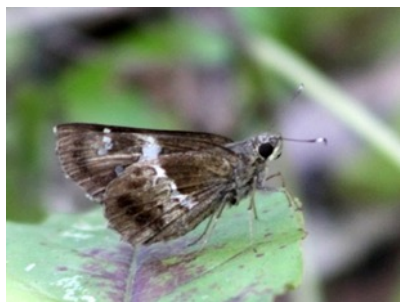
Cupitha purreea Moore, 1977



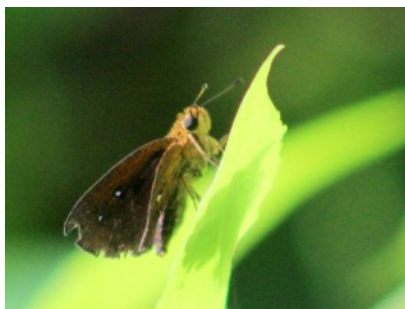
Gangara thyrasis Fabricius, 1775



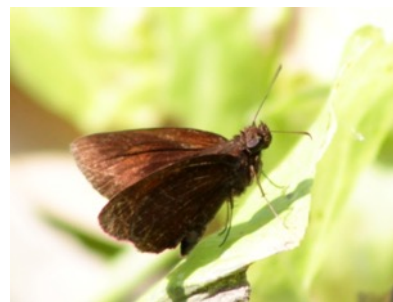
Hasora badra Moore, 1857



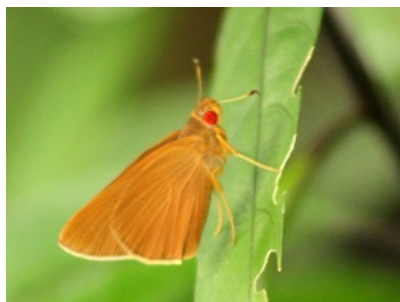
Hyarotis adrastus Moore,
1865



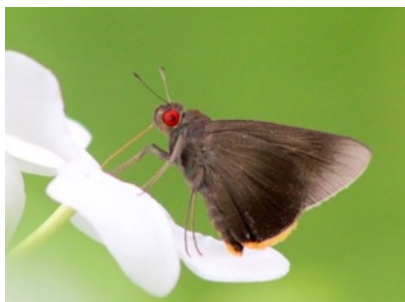
lambrix salsala Moore, 1865



Koruthaialos butleri de
Nicéville, 1883



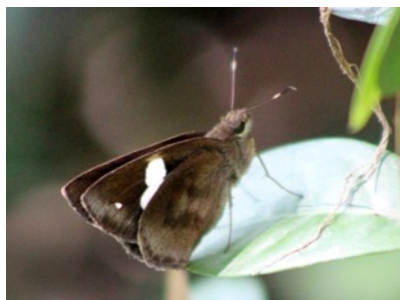
Matapa aria Moore, 1865



Matapa sasivarna Moore, 1865



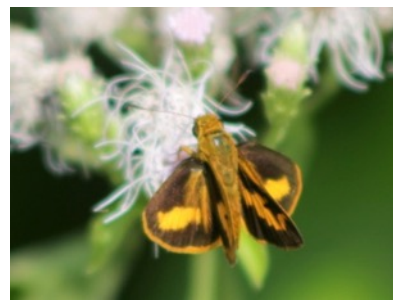
Notocrypta feisthameli
Moore, 1865



Notocrypta paralyos
Fruhstorfer, 1911



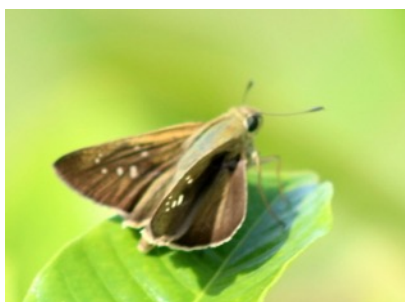
Odontoptilum angulata Felder,
1862



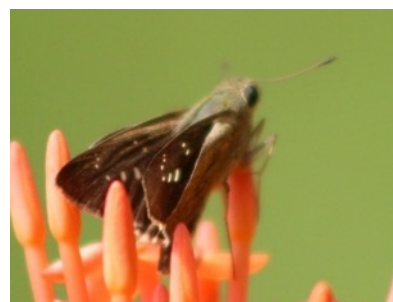
Oriens gola Mabille, 1883



Parnara guttatus Moore, 1865



Pelopidas agna Moore, 1865



Pelopidas mathias Fabricius,
1798



Pseudocoladenia dan Evans,
1949



Sancus fuligo Moore, 1878



Sarangesa dasahara Moore,
1865



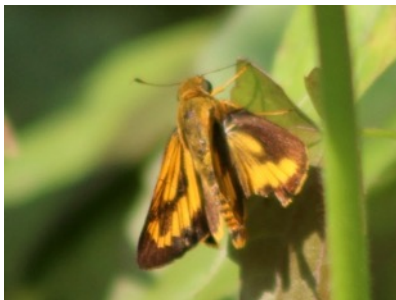
Suastus gremius Fabricius,
1798



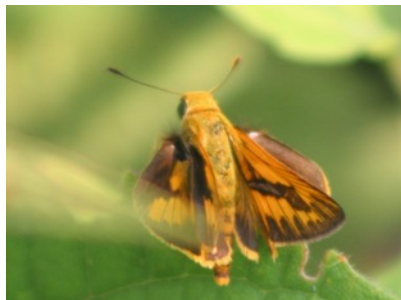
Tagiades japetus Moore, 1865



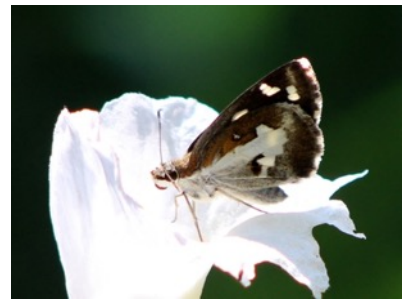
Taractrocera maevius
Fabricius, 1793



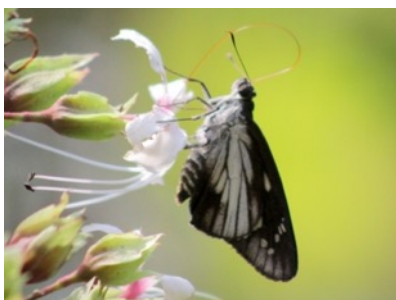
Telicota bambusae Moore,
1878



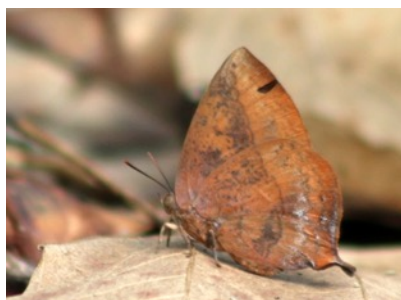
Telicota colon Fabricius, 1775



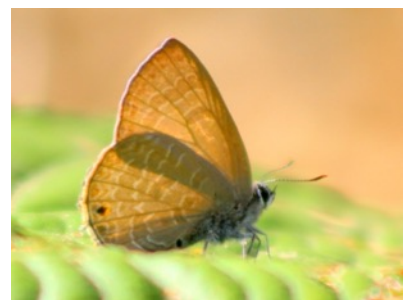
Udaspes folus Cramer, 1775



Unkana ambasa Moore, 1858



Amblypodia anita Hewitson,
1862



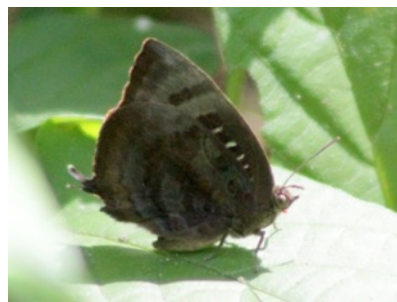
Anthene emolus Godart, 1823



Anthene Lycaenina Hewitson,
1878



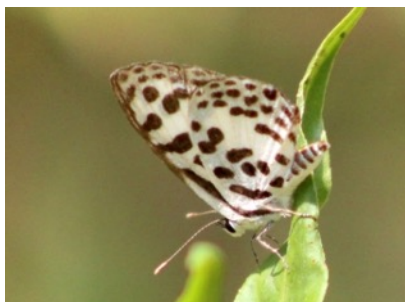
Arhopala agaba Hewitson,
1862



Arhopala centaurus Moore,
1883



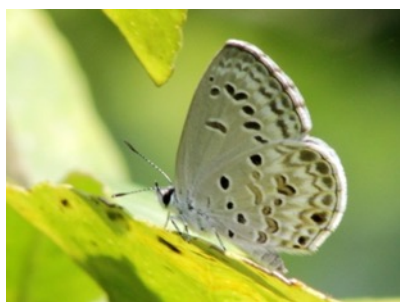
Arhopala eumolphus Cramer,
1780



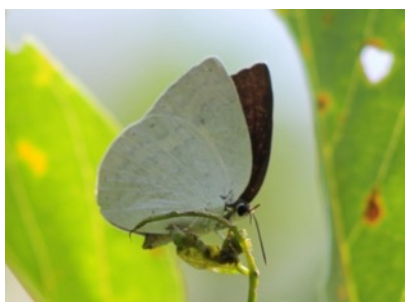
Castalius rosimon Fabricius,
1775



Catochrysops strabo Fabricius,
1793



Chilades lajus Stoll, 1870



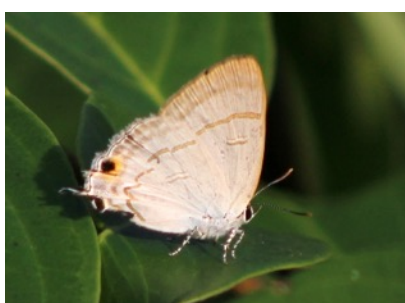
Curetis thetis Drury, 1773



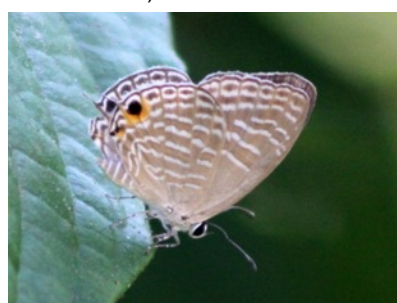
Discolampa ethion
Westwood, 1851



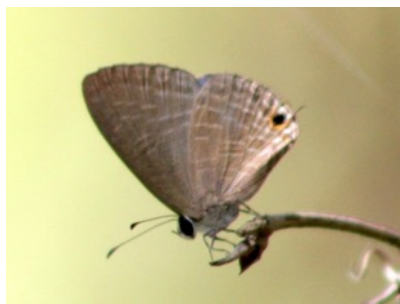
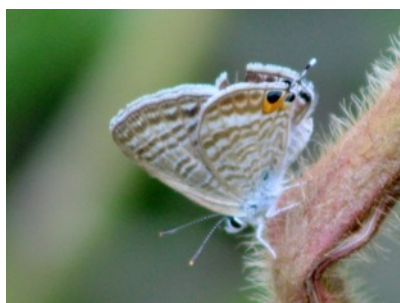
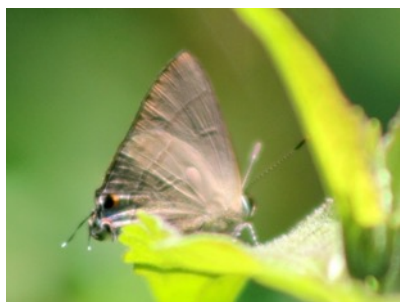
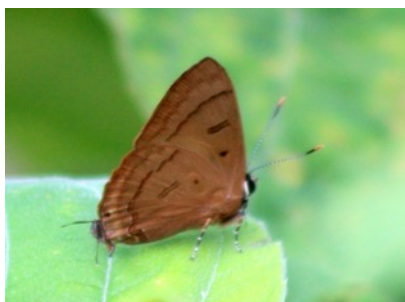
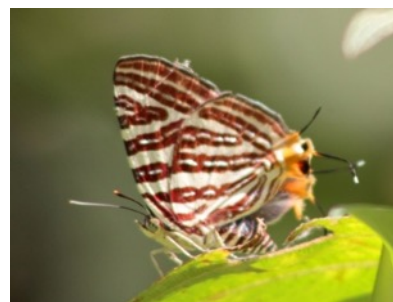
Euchrysops cnejus (Fabricius,
1798)



Hypolycaena erylus Godart,
1824



Jamides alecto Fruhstorfer,
1916

*Jamides bochus* Stoll, 1782*Jamides celeno*, (Cramer, 1775)*Jamides pura* Moore, 1886*Lampides boeticus* Linné, 1767*Loxura atymnus* Fruhstorfer, 1912*Neopithecops zalmora* (Butler, 1870)*Prosotas dubiosa* Evans, 1925*Prosotas nora* Moore, 1875*Pseudozizeeria maha* Kollar, 1848*Rapala manea* Hewitson, 1863*Rapala pheretima* Hewitson, 1863*Spindasis lohita* Moore, 1884



Spindasis syama Horsfield, 1829



Surendra quercetorum Moore, 1857



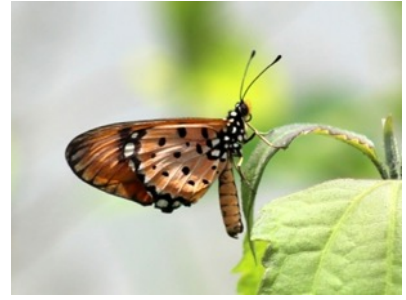
Zizeeria karsandra Moore, 1865



Zizina otis Fabricius, 1787



Zizula hylax Fabricius, 1775



Acraea violae Fabricius, 1775



Ariadne Ariadne Fruhstorfer, 1899



Ariadne merione Moore, 1884



Athyma inara Westwood, 1850



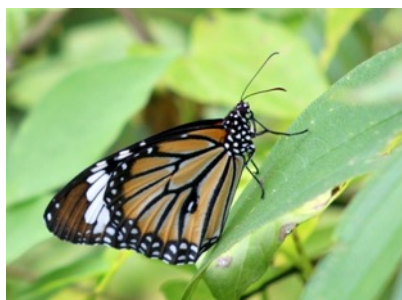
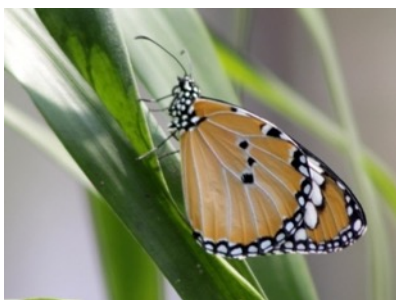
Athyma perius (Linnaeus, 1758)



Cethosia cyane Drury, 1773



Cupha erymanthis Sulzer, 1776



Danaus Chrysippus Linnaeus,
1758



Danaus genutia Cramer 1779



Elymnias hypermnestra Drury,
1773



Euploea algea Westwood,
1848



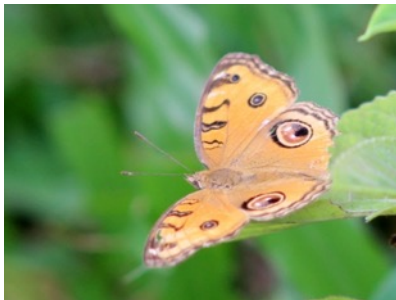
Euploea core Cramer, 1780



Euploea klugii Moore, 1857



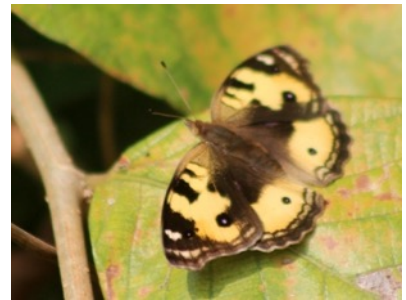
Euploea mulciber (Cramer,
1777)



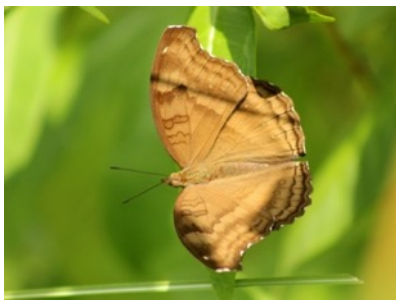
Euthelia aconthea Moore,
1857



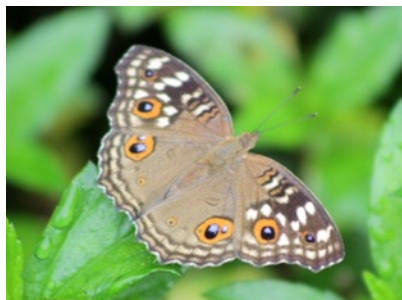
Hypolimnias bolina (Linnaeus,
1758)



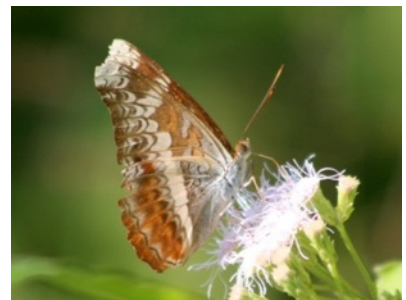
Junonia almana (Linnaeus,
1758)



Junonia atlites Linnaeus, 1763



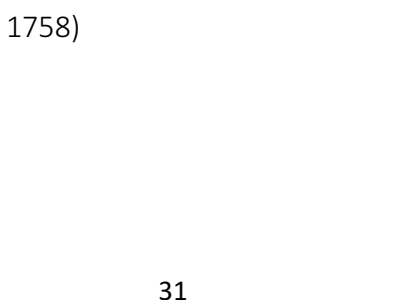
Junonia hierta (Fabricius,
1798)



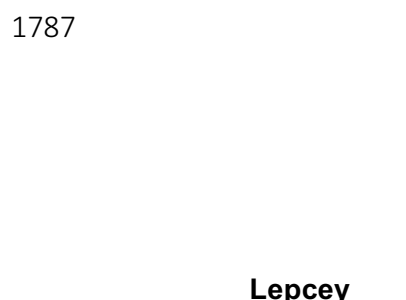
Junonia iphita (Cramer, 1779)

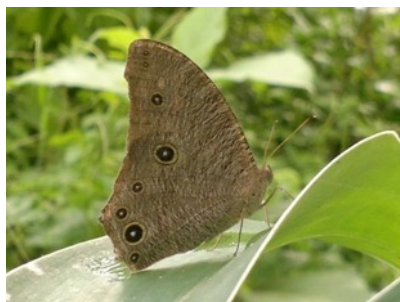


Junonia lemonias (Linnaeus,
1758)

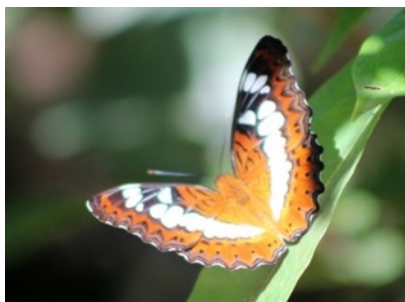


Lebadea martha Fabricius,
1787





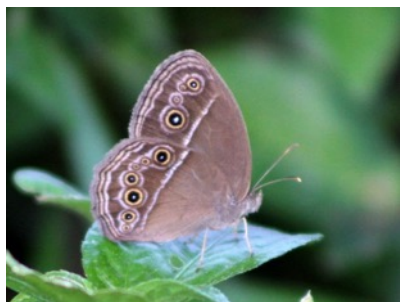
Melanitis leda Linnaeus, 1758



Moduza procris (Cramer, 1777)



Mycalesis mineus (Linnaeus, 1758)



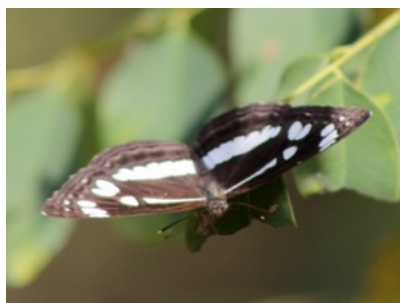
Mycalesis perseus Fabricius, 1798



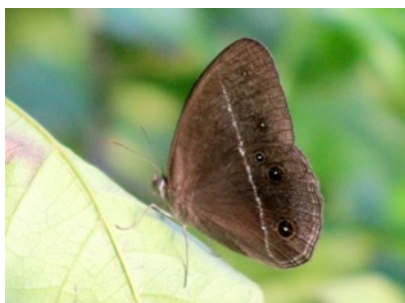
Neptis clinia Moore, 1872



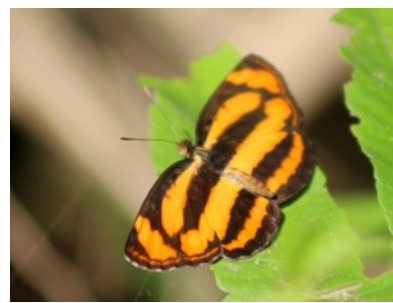
Neptis hylas Moore, 1758



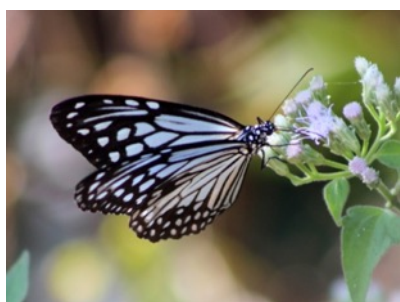
Neptis jumbah Moore, 1857



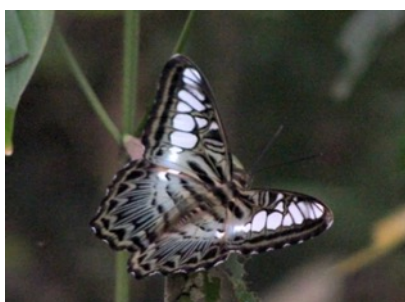
Orsotriaena medus Fabricius, 1775



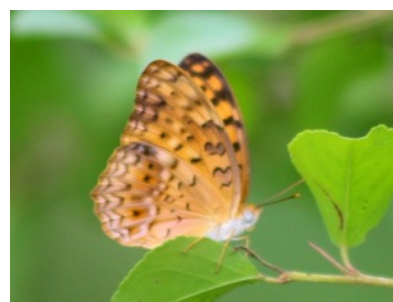
Pantoporia hordonia Stoll, 1790



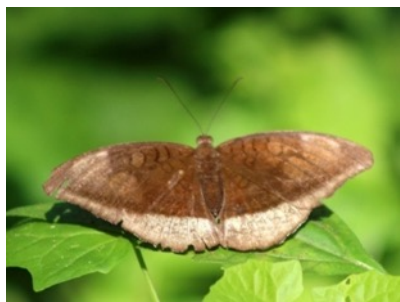
Parantica aglea (Stoll, 1782)



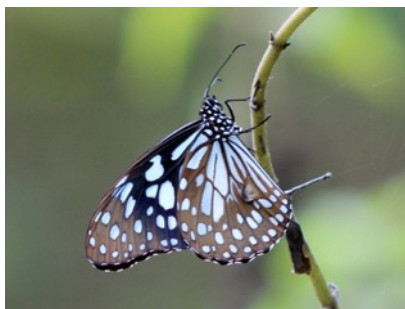
Parthenos Sylvia Fabricius, 1787



Phalanta phalantha (Drury, 1770)



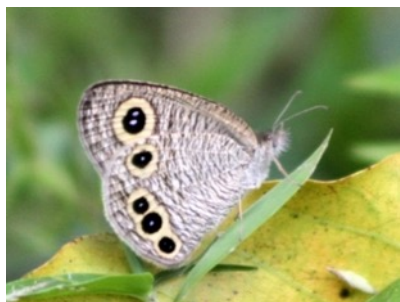
Tanaecia lepidea Butler, 1868



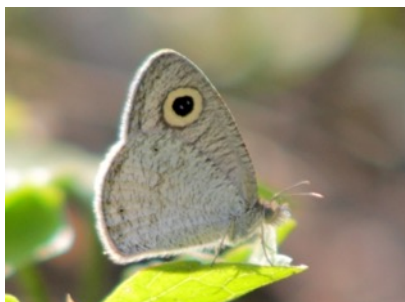
Tirumala limniace Gmelin, 1790



Ypthima baldus (Fabricius, 1775)



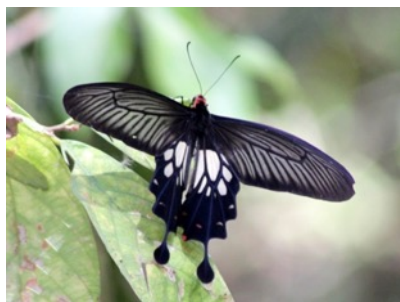
Ypthima huebneri Kirby, 1871



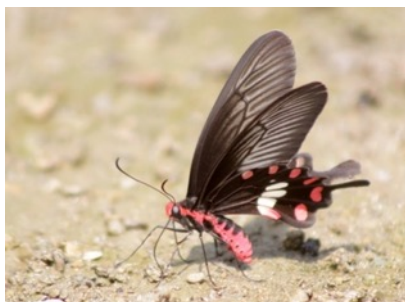
Ypthima inica Hewitson, 1864



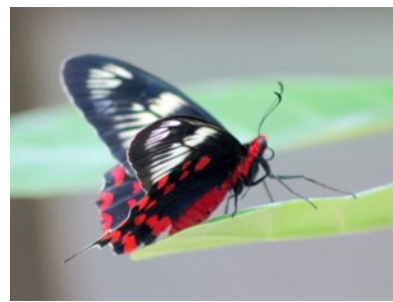
Chilasa clytia (Linnaeus, 1758)



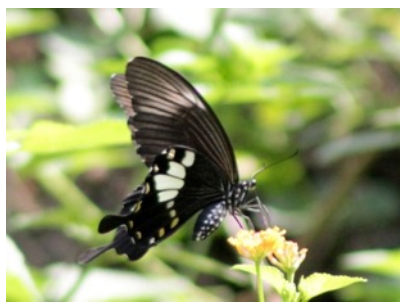
Losaria coon Butler, 1885



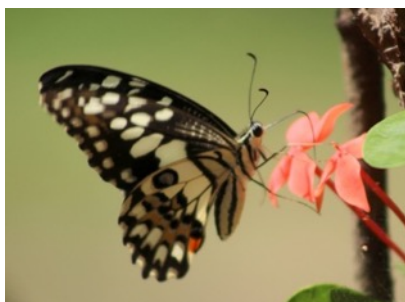
Pachliopta aristolochiae Fabricius, 1775



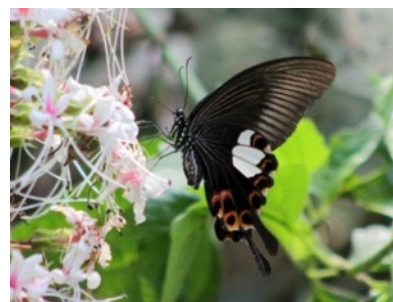
Pachliopta hector Linné, 1758



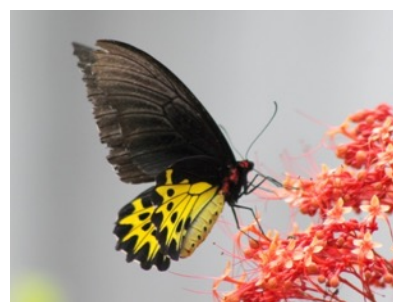
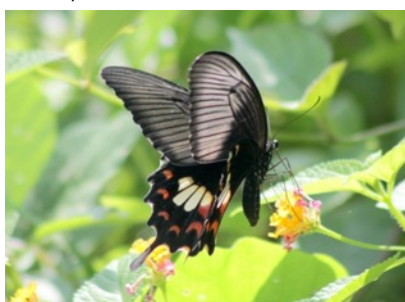
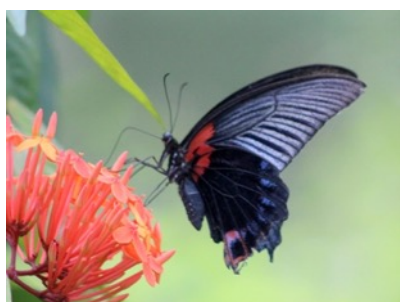
Papilio chaon Westwood, 1845

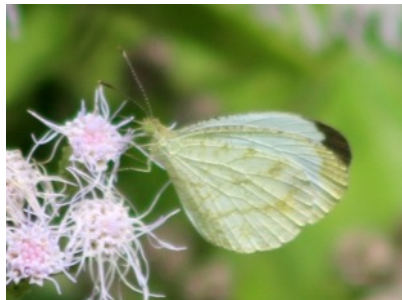


Papilio demoleus (Linnaeus, 1758)



Papilio helenus Linné, 1758



Papilio memnon Linnaeus, 1758*Papilio polytes* Cramer, 1775*Troides helena* Linnaeus, 1758*Appias lyncida* (Boisduval, 1836)*Appias libythea* Swinhoe, 1890*Catopsilia pomona* Fabricius, 1775*Catopsilia pyranthe* (Linnaeus, 1758)*Delias descombesi* (Boisduval, 1836)*Delias hyparete* Wallace, 1867*Delias pasithoe* Linnaeus, 1767*Eurema andersoni* Corbet & Pendlebury, 1932*Eurema blanda* (Wallace, 1867)*Eurema hecabe* Linnaeus, 1758*Leptosia nina* Fabricius, 1793*Zemerus flegyas* Cramer, 1780