

An annotated checklist of Butterflies from Royal Manas National Park, Gelephu, Bhutan

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ABSTRACT

The study was carried out from January to December 2014 within the Royal Manas National Park (RMNP) to come up with benchmark data on diversity of butterflies. It was found that during warmer months and at lower elevation maximum numbers of diversity of butterflies were encountered. A total of 181 species of butterflies were recorded belonging to five major families. Maximum numbers of species recorded were belonging to Nymphalidae and the least was Hesperidae. Out of 181 species (appendix. 2) 25 species of them are listed in schedule I, II and IV of the Indian Wildlife Protection Act (IWPA, 1972). Species such as Pale Wanderer *Pareronia avatar* (Moore), Panther *Neurosigma doubledayi* (Westwood) Jezebel Palmfly *Elymnias vasudeva* (Moore), Tailed Sulphur *Dercas verhuelli* (Moore), Magpie Crow *Euploea radmanthus* (Fabricius), Common birdwing *Troides Helena* (Linnaeus), Plain Tiger *Danaus chrysippus* (Linnaeus), Lime butterfly *Papilio Linnaeus* (Linnaeus) and Dark Archduke *Lexias pardalis* (Swinhoe) should be given conservation priority as they are found rarely in the study area.

Key words: Butterflies, Common, Conservation, Diversity, Rare.

1. INTRODUCTION

The first study of butterfly from Bhutan was done as early as 1905 (Bingham, 1905) and later (Evans, 1927) reflected *Armandia* found in Bhutan in book called "Identification of Butterflies". It was estimated that 800-900 species of butterflies can be found in Bhutan (Van der Poel & Wangchuk, 2007) but till to date there is no compressive butterfly checklist for Bhutan (Wangdi *et al.*, 2012). Several naturalists and researchers have studied and published guide books and papers about butterflies from pockets of Bhutan (eg. Van der Poel & Wangchuk, 2007; Wangdi & Sherab, 2012a & 2012b; Singh, 2012; Wangdi *et al.*, 2012; Singh & Chid, 2012). However, there is no detail record of butterfly from Royal Manas National Park (RMNP) except short study done by Nidup *et al.*, (2014).

RMNP is the oldest, richest bio-diversity and best protected (RMNP, 1995) area example along the south-center foothills of Bhutan. It is also a fifth largest national park of Bhutan and established as wildlife sanctuary in 1964 and later it was re-notified as national park in 1993 (RMNP, 2009). This study was started from January to December 2014 to explore and to collect scientific benchmark data on butterfly diversity that would help to suggest management planner to come out with some conservation plan for priority species in future.

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2. MATERIAL AND METHODS

Study area

The RMNP recites in a strategic location (90° 35'E to 91°13'E and 26° 46'N to 27° 08'N) in the confluence of the Indo-Gangetic and Indo-Malayan bio-geographical realms constituting a unique ecosystem of international significance. Further it share borders with World Heritage Site (Indian Manas Tiger Reserve) forming a greater trans-boundary conservation landscape (RMNP, 2012). It also share border with one PA and connects with three other PA by corridors within the country (Fig.1). RMNP occupy an area of 1057 km² and it is divided in to three working zone viz. Gomphu, Manas and Umling (Fig.2)

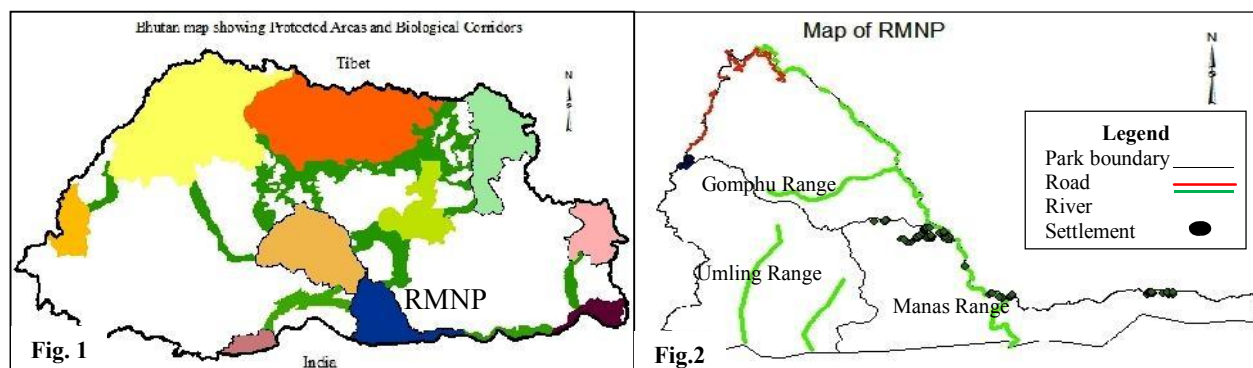


Fig. 1. Bhutan map showing 10 Protected Areas in different colours (Royal Manas National Park in Blue colour) and Biological Corridors in dark green colour. **Fig. 2.** Royal Manas National Park showing three field offices (study area).

Park has range of climatic seasons each offering a unique experience with temperature ranging from 20°C to 34°C (Tempa *et al.*, 2012). Southern part of the park receive heaviest rainfall with the record of almost 1200mm during the peak season, whereas 400mm in the northern part. Park is widespread between elevations of 80m in the southern foothills to 2714m in the north. Owing to varied climatic conditions and topographic features, the park offers diverse habitat types for critically and endangered species viz., Chinese Pangolin, Bengal tiger, Asian elephant, Asiatic water buffalo, Binturong, Dhole, Golden langur. Bhutan's biggest and largest "river Manas" runs through the park approximately 11 Km. and join with river Brahmaputra downstream.

Methods

Diversity of butterfly was studied in four different season's viz. winter, spring, summer and autumn from January to December 2014. Every preferred habitat by butterflies such as closed canopy, shrub land, crop field, roads and river/stream beds were scanned from 80 meters to 2714 meters within RMNP. Surveys were conducted during sunny day i.e. 0900 to 1100 hours in morning and 0300 to 0500 hours towards afternoon (Sundufu & Dumbuya, 2008; Ramesh *et al.*, 2010). Each working zone was visited once in every three months which covered all four seasons. Stoppages were made to resolve identification problems either by photograph or capture by butterfly sweep net for closer examination. Further recording was resumed from the point where the walk was interrupted. Captures of butterflies were done very safely by butterfly sweep net and release in the same area immediately after the photographs were taken. Only natural dead butterflies found during survey were collected for voucher specimen. Butterflies species identification followed (Haribal, 1992; Smith, 1993; Van der Poel & Wangchuk, 2007; Kehimkar, 2008; Venkataraman, 2010; Singh, 2012; Singh & Chib, 2012; Wangdi *et al.*, 2012; Wangdi & Sherub, 2012a; 2012b).

3. RESULT AND DISCUSSION

Highest diversity of butterflies was encountered during warmer period of year from March to June and Mid-August to Mid-October in RMNP. Similar study in Sunkosh and Mendegang in central Bhutan also found same (Singh, 2012; Singh & Chib, 2012). Other study also found that heavy rain and less sunny days during July to Mid- August resulted in less numbers of butterflies on their wings (Singh, 2012). A total of 181 species of butterflies belonging to five major families were recorded during the entire study period. Maximum species number was recorded from lower altitude as compared to higher altitude. Forest in the Himalayan region and elsewhere also harbor high diversity at low elevation since this area could provide diverse host plants for butterflies (Pandit *et al.*, 2007). Study carried out in Sikkim also revealed that species richness, abundance and diversity peaked at low altitude and declined towards high altitude (Acharya & Vijayan, n.d.). This study found that maximum numbers of Jezebel species were on their wings during Mid-August to September.

The rare encountered butterflies during the one year study period that should be given conservation priority were **Pale Wanderer - *Pareronia avatar* - Moore** (Fig. 3): This species was first encountered along the road near Sherkimlaptsha during peak monsoon period. Later it was also encountered in few different locations within park but not in large numbers.

Apart from Bhutan this species can be seen in some parts of India, Myanmar and Nepal (Kehimkar, 2008). Usually on the wing from April, June, October to December and can be found up to 1100m.

Tailed Sulphur - *Dercas verhuelli* - Moore 1905 (Fig. 4). This species was encountered only once along the stream bed of Nangchu (N 26° 48' E 090° 57') at an altitude 113m. This species was also recorded in Mendegang (Singh & Chib, 2012).

It can be found in India, Nepal and Myanmar (Kehimkar, 2008). Usually on the wing from May to July and can be seen flying up to 1200m in Himalaya.

Club beak - *Libythea myrrha rama* - Moore 1872 (Fig. 5): It was encountered only once during January along the Gelongkhola stream bed at N26° 47' E090°51' at 303m. Usually it is found between 900m to 3000m from March to October in the Himalaya and during spring even come down to 400m to breeds (Kehimker, 2012). Apart from Bhutan it can be seen in India, Pakistan, Afghanistan, Nepal and Bangladesh.

Magpie Crow - *Euploea radmanthus* - Fabricius 1973 (Fig. 6): This species is also rarely seen in RMNP. It was first encountered in elephant fodder plantation area near Manas range N26°47' E090°57' at an altitude 122m. It flies up to 1200m and on the wings from April to June and October to December. Name of this butterfly is combination of two birds' name (Magpie and Crow). This butterfly belongs to the Crows and Tigers, which is the Danaid group of the Brush-footed butterflies' family and found in Indo-Malayan region (Saji & Ogale, 2014).

Panther - *Neurosigma siva* - Westwood 1850 (Fig. 7): This species was rarely seen in RMNP. I have seen once along the mule track from Changazan to Shelingtoe. It was captured in my camera during May at N26°54'E090°54' at an altitude 179m. It can be seen around 300m to 500m and usually on wings from March to May and September to November. Found in India, Bangladesh, Myanmar (Kehimker, 2012) and Thailand (Hemming, 1967). No details study has been done on this species.

Common birdwing - *Troides Helena* - Linnaeus (Fig. 8): This species is one of the most striking butterflies with large in size and bright yellow with black line on wings. I encountered this species near to Rechanglu at N26°48' E091°00' at an altitude 225m. On the wings from March to November and found along the foothills of Himalaya up to 900m. Usually forest dweller and flies high but often comes to feed on flowers and also visit open areas of forest edge. This butterfly is also found in some parts of India, Nepal and Bangladesh.

Plain Tiger - *Danaus chrysippus* - Linnaeus 1758 (Fig. 9): This species is commonly found in India (Kehimker, 2012) but whereas in the study area it was encountered very rarely. This species was encountered near Rabang. Prefers open area but can be seen in high forest up to 2500m. This species also can be found in some parts of Nepal, Bangladesh, Pakistan, Afghanistan, Sri Lanka and Myanmar.

Lime butterfly - *Papilio demoleus* - Linnaeus 1758 (Fig. 10): This butterfly can be seen around resident area and visiting flowers growing in garden. I have seen this butterfly on citrus plant in Manas range compound at N26°47' E090°57' at altitude 121m. The female lays their eggs on the citrus plants where larva feed on. This butterfly was also being recorded in in Sunkosh and Meldagang (Singh, 2012; Singh & Chib, 2012). It can be seen in India, Nepal, Pakistan, Afghanistan, Sri Lanka, Myanmar and Bangladesh.

Jezebel Palmfly - *Elymnias vasudeva* - Moore (Fig. 11): This species was first seen in Manas range compound at N26°47' E090°57' at altitude 122m. When I saw this species it was very old, faded and worn-out. It was in same area for 2-3 days and later it was dead and collected for specimen. Species was seen rarely. No detail study was conducted on this species.

Dark Archduke - *Lexias pardalis* - Swinhoe 1893 (Fig. 12): This species was also rarely encountered in study area and in India also its status is rare (Kehimker, 2012). This species was encountered during monsoon season just above Changazam under dense canopy. This species flies up to 1000m from April to November. Apart from Bhutan it is also seen in some parts of Bangladesh and Myanmar.

Most commonly seen butterflies in RMNP were Chestnut angle, Common Spotted Flat, Fulvous Pied Flat and Tiger Hopper of *Hesperiidae*. Common Quaker, Purple sapphire, Common Pierrot, Malayan and Plum Judy of *Lycaenidae*. Punchinello, Blue Pansy, Chocolate Pansy, Lemon Pansy, Common Sailer, Common Lascar, Common Jester, Common Pamfly, Common Crow, Striped Blue Crow, Common Fivering, Long Brand Bushbrown, Common Bushbrown, Common Evening Brown and Straight Banded Treebrown of *Nymphalidae*. Common Mormon, Common Raven and Paris Peacock of *Papilionidae*. India Cabbage White, Great Orange Tip, Three Spot Grass Yellow, Yellow Orangetip and Chocolate Albatross of *Pieridae*.

4. CONCLUSION

High diversity of butterflies indicates that RMNP is an extremely rich and productive ecosystem for conservation and potential ecotourism site. 181 species recorded during this study would not be the compressive checklist of butterflies for RMNP. Study covered all the areas but maximum and repeatedly the lower elevation were covered. So, more exploration in higher altitude areas would yield more species for RMNP. Conservation work with priority species of butterflies and potential area within the park will be a way forward to conserve and protect rare species. No as such major threats were found within the park area except some new road construction and illegal intruders from across the border.

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Appendix 1. Lists of rarely encountered species in the study area.



Fig. 3. Pale Wanderer



Fig. 4. Tailed Sulphur



Fig. 5. Club beak



Fig. 6. Magpie Crow



Fig. 7. Panther



Fig. 8. Common birdwing



Fig. 9. Plain Tiger



Fig. 10. Lime butterfly



Fig. 11. Jezebel Pamfly



Fig. 12. Dark Archduke

Appendix. 2. Annotated checklist of butterflies of Royal Manas National Park

	Common Name	Scientific Name	IWPA 1972
Sl. No.	Family: Hesperidae		
1	Coon	<i>(Sancus folio – Mabille)</i>	
2	Chestnut Angle	<i>Odontoptilium angulata angulata</i> (Felder-1862)	
3	Common Awl	<i>Hasora badra badra</i> (Fruhstorfer-1911)	
4	Dusky Yellow Breasted Flat	<i>Gerosis phisara phisara</i> (Mabille-1903)	
5	Common Spotted Flat	<i>Celaenorhinus leucocera</i> (Koller)	
6	Fulvous Pied Flat	<i>Coladenia dan festa</i> (Evans-1949)	
7	Great Swift	<i>Pelopidas assamensis</i> (Wood-Mason & De Niceville-1882)	Schedule IV
8	Himalayan Dart	<i>Potanthus dara</i> (Kollar)	
9	Indian Skipper	<i>Spialia galba</i> (Fabricius-1793)	
10	Orange Awlet	<i>Bibasis jaina</i> (Moore)	
11	Orange Tail Awl	<i>Bibasis sena</i> (Moore)	Schedule II
12	Pale Palm Dart	<i>Telicota colon</i> (Fabricius-1775)	
13	Restricted Demon	<i>Notocrypta curvifas</i> (Felder)	
14	Small Branded Swift	<i>Pelopidas thrax masta</i> (Evans-1949)	
15	Tiger Hopper	<i>Ochus subvittatus subradiatus</i> (Moore-1778)	
16	Water Snow Flat	<i>Tagiades litigiosa litigiosa</i> (Hubner-1819)	
	Family: Lycaenidae		
1	Angled Sunbeam	<i>Curetis acuta</i> (Moore)	
2	Banded Line Blue	<i>Prosotas aluta coelestis</i> (De Niceville)	
3	Bright Sun Beam	<i>Zeltus amasa</i> (Fabricius)	
4	Chocolate Royal	<i>Remelana jangala ravata</i> (Moore-1884)	
5	Common Acacia Blue	<i>Surendra quercetorum</i> (Moore-1857)	
6	Common Beak	<i>Libythea lepita lepita</i> (Moore-1857)	Schedule II
7	Common Gem	<i>Poritia hewitsoni hewitsoni</i> (Moore-1865)	
8	Common Imperial	<i>Cheritra freja freja</i> (Fabricius-1793)	
9	Common Pierrot	<i>Castalius rosimon rosimon</i> (Fruhstorfer)	Schedule II
10	Common Tinsel	<i>Catapaecilma elegans</i> (Druce)	
11	Common Tit	<i>Hypolycaena erylus himavantus</i> (Fruhstorfer)	
12	Common Quaker	<i>Neopithecops zalmora zalmora</i> (Distance-1884)	
13	Club Beak	<i>Libythia myrrha</i> (Godart)	
14	Elbowed Pierrot	<i>Celeta elna noliteia</i> (Fruhstorfer-1922)	
15	Fluffy Tit	<i>Zeltus amasa</i> (Fabricius)	
16	Forget Me Not	<i>Catochrysops panormus</i> (Fabricius-1793)	
17	Large Hedge Blue	<i>Celastrina huegelii oreana</i> (Moore-1883)	
18	Large Oak Blue	<i>Arhopala amantes amantes</i> (Hewitson-1862)	
19	Malayan	<i>Megisba malayan sikkima</i> (Moore-1879)	Schedule II
20	Metallic Cerulean	<i>Jamides alecto eurysaces</i> (Fruhstorfer)	Schedule II
21	Orchid Tit	<i>Chliaria othona</i> (Hewitson-1865)	

22	Pale Grass Blue	<i>Pseudozizeeria maha</i> (Kollar-1848)	
23	Pea Blue	<i>Lampides boeticus</i> (Linnaeus-1767)	Schedule II
24	Purple Sapphire	<i>Heliophorus epicles indicus</i> (Fruhstorfer)	
25	Plum Judy	<i>Abisara echerius suffusa</i> (Moore-1878)	
26	Slate Flash	<i>Rapala manea schistacea</i> (Moore-1879)	
27	Western Centaur Oakblue	<i>Arhopala pseudocentaurus</i> (Doubleday)	
28	White Bordered Copper	<i>Lycaena pavana</i> (Kollar)	
29	Yamfly	<i>Loxura atymnus continentalis</i> (Fruhstorfer)	
Family: Nymphalidae			
1	Angled Castor	<i>Ariadne ariadne pallidior</i> (Fruhstorfer)	
2	Autumn Leaf	<i>Doleschallia bisaltide indica</i> (Moore-1881)	Schedule I
3	Black Forester	<i>Lethe vindhya</i> (C. & R. Felder)	
4	Black Prince	<i>Rohana parisatis parisatis</i> (Moore-1857)	
5	Black Raja	<i>Charaxes solon</i> (Fabricius-1781)	
6	Blackvein Sergeant	<i>Parathyma ranga ranga</i> (Moore-1857)	Schedule II
7	Bright Eye Bushbrown	<i>Mycalis nicotia</i> (Westwood-1850)	
8	Blue Glassy Tiger	<i>Tirumala limniace leopardus</i> (Moore-1880)	
9	Brown King Crow	<i>Euploea klugii klugii</i> (Moore-1858)	
10	Blue Pansy	<i>Precis orithya ocyale</i> (Hubener-1816)	
11	Chocolate Pansy	<i>Precis iphita iphita</i> (Cramer-1779)	
12	Chocolate Tiger	<i>Parantica melaneus platiniston</i> (Fruhstorfer-1910)	
13	Circe	Hestina nama (Doubleday-1845)	
14	Commander	<i>Modusa procris procris</i> (Cammer-1877)	
15	Commodore	<i>Limenitis danava</i> (Moore-1857)	
16	Colour Sergeant	<i>Parathyma nefte inara</i> (Doubleday & Hewitson-1850)	
17	Common Castor	<i>Ariadne meriono assama</i> (Evans)	
18	Common Crow	<i>Euploea core core</i> (Cramer-1790)	
19	Common Bushbrown	<i>Mycalis perseus blasius</i> (Fabricius-1798)	
20	Common Earl	<i>Tanaecia julii appiades</i> (Menetries-1857)	
21	Common Evening Brown	<i>Melanitis leda</i> (Linnaeus)	
22	Common Fivering	<i>Ypthima baldus baldus</i> (Fabricius-1775)	
23	Common Jester	<i>Symbrenthai lilaea khasiana</i> (Moore-1874)	
24	Common Lascar	<i>Pantoporia hordinia hordinia</i> (Stoll-1791)	
25	Common Leopard	<i>Phalanta phalantha</i> (Drury-1770)	
26	Common Map	<i>Cyrestis thyodamas thyodamas</i> (Boisduval-1836)	
27	Common Maplet	<i>Chersonesia risa risa</i> (Doubleday & Hewitson-1850)	
28	Common Pamfly	<i>Elymnias hypermnestra undularis</i> (Drury-1773)	
29	Common Sailer	<i>Neptis hylas varmona</i> (Moore-1872)	
30	Common Tiger	<i>Danaus (Salathura) genutia</i> (Cramer-1779)	
31	Courtesan	<i>Euripus halitheres</i> (Doubleday and Hewitson-1848)	
32	Cruiser	<i>Vindula erota erota</i> (Fabricius-1793)	
33	Dark Archduke	<i>Lexias dirtea khasiana</i> (Swinhoe-1893)	
34	Dark Brand Bushbrown	<i>Mycalis mineus mineus</i> (Linnaeus-1765)	
35	Dark Blue Tiger	<i>Tirumala septentrioni</i> (Butler-1874)	Schedule II

36	Dark Evening Browning	<i>Melanitis phedimebele bela</i> (Moore-1875)	
37	Dot-Dash Sergeant	<i>Parathyma kanwa</i> (Moore)	
38	Double Branded Blue Crow	<i>Euploea sylvester hopei</i> (Fabricius-1793)	
39	Great Eggfly	<i>Hypolimnas bonila</i> (Linnaeus-1758)	
40	Grey Pansy	<i>Precis atlites atlites</i> (Johanssen-1764)	Schedule I
41	Great Nawab	<i>Polyura eudamippus eudamippus</i> (Doubleday-1843)	
42	Glassy Tiger	<i>Parantica aglea melanoidea</i> (Moore-1883)	
43	Grey Count	<i>Tanaecia lepidea lepidea</i> (Butler-1868)	
44	Himalayan Fivering	<i>Ypthima sakra sakre</i> (Moore-1857)	
45	Indian Red Admiral	<i>Vanessa indica indica</i> (Herbst-1794)	
46	Indian Fritillary	<i>Agyreus hyperbius hyperbius</i> (Johanssen-1764)	
47	Indian Purple Emperor	<i>Apatura ambica ambica</i> (Kollar)	
48	Indian Tortoiseshell	<i>Aglais cashmiriensis aesis</i> (Kollar-1844)	
49	Jezebel Palmfly	<i>Elymnias vasudeva vasudeva</i> (Moore-1857)	
50	Jungle Glory	<i>Thaumantis diores</i> (Doubleday)	Schedule II
51	Knight	<i>Lebadea martha martha</i> (Fabricius-1787)	
52	Large Yeoman	<i>Cirrochroa aoris aoris</i> (Doubleday-1847-48)	
53	Lemon Pansy	<i>Precis lemonias lemonias</i> (Linnaeus-1758)	
54	Leopard Lacewing	<i>Cethosia cyane</i> (Drury-1770)	
55	Long Brand Bushbrown	<i>Mycalesis visala visala</i> (Moore-1857)	
56	Magpie Crow	<i>Euploea radmanthus</i> (Fabricius-1973)	
57	Nigger	<i>Orsotrioena medus medus</i> (Fabricius-1775)	
58	Orange Oakleaf	<i>Kallima inachus inachus</i> (Boisduval-1836)	
59	Orange Staff Sergeant	<i>Athyma cama</i> (Moore)	
60	Peacock Pansy	<i>Precis almana almanac</i> (Linnaeus-1758)	
61	Painted Courtesan	<i>Euripus consimilis consimilis</i> (Westwood-1850)	
62	Pale Green Sailer	<i>Neptis zaida bhutanica</i> (Doubleday)	
63	Pallid Nawab	<i>Polyura arja</i> (Felder and Felder-1867)	
64	Panther	<i>Neurosigma doubledayi doubledayi</i> (westwood-1848)	
65	Pasha	<i>Herona marathus marathus</i> (Doubleday-1848)	
66	Plain Earl	<i>Tanaecia jahnu</i> (Moore-1857)	
67	Plain Tiger	<i>Danaus (Anosia) schrysippus</i> (Linnaeus-1758)	
68	Popinjay	<i>Stibochiona nicea nicea</i> (Gray-1833-1846)	
69	Punchinello	<i>Zemeros flegyas indicus</i> (Fabricius-1897)	
70	Red Lacewing	<i>Cethosia biblis tisamena</i> (Fabricius-1770)	
71	Straight Banded Treebrown	<i>Neope verma sintica</i> (Fruhstorfer-1911)	
72	Streaked Baron	<i>Euthalia jama jamida</i> (Felder-1866)	
73	Striped Blue Crow	<i>Euploea mulciber mulciber</i> (Cramer-1777)	
74	Small Staff Sergen	<i>Parathyma zeroa</i> (Moore-1872)	Schedule IV
75	Small Yellow Sailer	<i>Neptis miah</i> (Moore- 1857)	
76	Spotted Sailer	<i>Neptis magadha</i> (C. & R. Felder)	
77	Staff Sergeant	<i>Parathyma selenophora selenophora</i> (Kollar-1844)	
78	Sullid Sailer	<i>Neptis soma</i> (Moore-1858)	

79	Tabby	<i>Pseudergolis wedah</i> (Kollar-1844)	Schedule II
80	Tawny Rajah	<i>Charaxes polyxena hierax</i> (Felder--1867)	
81	Vagrant	<i>Vagrans egista</i> (Hemming-1934)	Schedule II
82	Variegated Rajah	<i>Charaxes kahruha</i> (Moore)	
83	Whitebar Bushbrown	<i>Mycalesis anaxias oemate</i> (Frusstorfer-1911)	Schedule II
84	White Edged Blue Baron	<i>Euthalia phemius</i> (Doubleday and Hewitson-1848)	
85	Yellow Coster	<i>Pareba vesta</i> (Fabricius-1787)	
86	Yellow Jack Sailer	<i>Lassipa viraja viraja</i> (Moore-1872)	
87	Yellow Pansy	<i>Precis hierta magna</i> (Evans-1923)	
88	Yellow Rajah	<i>Charaxea marmax</i> (Ochsenheimer-1816)	
89	Yellow Sailer	<i>Neptis ananta</i> (Moore)	Schedule II
Family: Papilionidae			
1	Blue Striped Mime	<i>Chalasa slateri slateri</i> (Hewison 1859)	Schedule II
2	Common Batwing	<i>Atrophaneura varuna astorion</i> (Westwood-1842)	
3	Common Birdwing	<i>Troides Helena</i> (Linnaeus)	
4	Common Blue Bottle	<i>Graphium sarpedom sarpedom</i> (Linnaeus-1758)	
5	Common Jay	<i>Graphium doson axion</i> (Felder, C., and R.-1864)	
6	Common Lime	<i>Chilasa clytia clytai</i> (Linnaeus-1758)	
7	Common Raven	<i>Papilio castor</i> (Westwood)	
8	Common Rose	<i>Pachilopta aristolochiae aristolochiae</i> (Fabricius-1775)	
9	Common Windmill	<i>Atrophaneura polyeuctes</i> (Doubleday-1842)	
10	Fourbar Swordtail	<i>Graphium agetes</i> (Westwood)	
11	Fivebar Swordtail	<i>Pathysa antiphates pompilius</i> (Fabricius-1787)	
12	Great Mormom	<i>Papilio memnon agenor</i> (Linnaeus)	
13	Lesser Batwing	<i>Atrophaneura aidoneus</i> (Doubleday-1845)	Schedule I
14	Lime Butterfly	<i>Priniceps demoleus</i> (Linnaeus-1758)	
15	Lesser Zebra	<i>Graphium macareus</i> (Godart)	
16	Paris Peacock	<i>Papilo paris</i> (Linnaeus)	
17	Red Breast	<i>Papilio alcmenor</i> (C. & R. Felder- 1864)	
18	Red Helen	<i>Papilo helenus</i> (Linnaeus)	
19	Spot Sword tail	<i>Pathysa nomius nomius</i> (Esper-1785-98)	
20	Tailed Jay	<i>Graphium agammemnon agammemnon</i> (Linnaeus-1758)	
21	Yellow Helen	<i>Papilio (menelaides) nephelus</i> (Westwood-1845)	
Family: Pieridae			
1	Chocolate Albatross	<i>Appias lyncida elenora</i> (Boisduval-1836)	Schedule II
2	Common Emigrant	<i>Catopsilia pomona</i> (Fabricius-1775)	
3	Common Grass Yellow	<i>Terias hecabe contubernalis</i> (Moore-1886)	
4	Common Gull	<i>Cepora nerissa nerissa</i> (Fabricius-1775)	Schedule II
5	Common Wanderer	<i>Pareronia valeria</i> (Cramer)	
6	Dark Clouded Yellow	<i>Colias fieldii</i> (Menetries-1855)	
7	Great Orange tip	<i>Hebomoia glaucippe glaucippe</i> (Linnaeus-1758)	
8	Indian Cabbage White	<i>Pieris canidia indica</i> (Evans-1926)	
9	Large Cabbage White	<i>Pieris brassicae nepalensis</i> (Grey-1846)	
10	Lesser Gull	<i>Cepora nadina nadina</i> (Lucas-1852)	Schedule II

11	Mottled Emigrant	<i>Catopsilis pyranthe</i> (Linnaeus-1758)	
12	One Spot Grass Yellow	<i>Eurema andersoni andersoni</i> (Moore-1886)	Schedule II
13	Pale Wanderer	<i>Pareronia avatar avatar</i> (Moore-1857)	Schedule II
14	Pale Jezebel	<i>Delias sanaca oreas</i> (Talbot-1928)	
15	Plain Puffin	<i>Appias indra</i> (Moore-1857)	Schedule II
16	Psyche	<i>Leptosia nina nina</i> (Fabricius-1793)	
17	Red Spot Jezebel	<i>Delias descombesi leucacantha</i> (Boisduval-1836)	
18	Red Base Jezebel	<i>Delias aglaia</i> (Linnaeus-1758)	
19	Spot Puffin	<i>Appias lalage</i> (Doubleday)	
20	Spotted Sawtooth	<i>Leptosia thestylis thestylis</i> (Doubleday-1842)	
21	Striped Albastross	<i>Appias libythea olferna</i> (Fabricius)	
22	Tailed Sulphur	<i>Dercas verhuelli doubledayi</i> (Moore-1905)	
23	Three Spot Grass Yellow	<i>Eurema blanda silhetana</i> (Wallace-1867)	
24	Tree Yellow	<i>Gandaca harina assamica</i> (Moore-1906)	
25	Yellow Jezebel	<i>Delias agostina</i> (Hewitson-1852)	
26	Yellow Orange tip	<i>Ixias pyrene familiaris</i> (Butler-1896)	

REFERENCES

- Acharya K B. and Vijayan L. (2011). Butterflies of Sikkim with reference to elevational gradient in species, abundance, composition, similarity and range size distribution. Sikkim. <<http://sikkimforest.gov.in/Reports%20and%20Publications/Biodiveristy-of-Sikkim/> Accessed on 24th Nov. 2014.
- Bingham C T. *The Fauna of British India including Ceylon and Burma - Butterflies*. Taylor and Francis Ltd., London, UK. 1905.
- Haribal M. The Butterflies of Skkim Himalaya and their natural history. Printed by Thomson press, India Ltd., Farodabad, Haryana. Published by Skkim Nature Conservation Foundation (SNCF), Gangtok, Sikkim. 1992.
- Hemming F. The generic names of the butterflies and their type-species (Lepidoptera: Rhopalocera) 1967.
- Nidup T., Dorji T. and Tshering U. Taxon diversity of butterflies in different habitat types in Royal Manas National Park, Bhutan. *Journal of Entomology and Zoology Studies*, 2014.
- Pandit M K., Sodhi N S., Koh L P., Bhaskar A. and Brook B W. Unreported yet massive deforestation driving loss of endemic biodiversity in Indian Himalaya. *Biodiversity and Conservation*, 2007.
- Royal Manas National Park. Conservation management plan. Nature conservation section, Forestry Services Division, Ministry of Agriculture, Royal government of Bhutan, 1995.
- Saji K. and H. (2014). Ogale *Papilio helenus* Linnaeus, 1758 – Red Helen. In K. Kunte, S. Kalesh & U. Kodandaramaiah (eds.). *Butterflies of India*, v. 2.10. Indian Foundation for Butterflies. <http://www.ifoundbutterflies.org/sp/655/Papilio-helenus>. Accessed on 30th Nov. 2014.
- Singh A P. Lowland forest butterflies of the Sankosh River catchment, Bhutan. *Journal of Threatened Taxa*, 2012. 4 (12): 3085–3102.
- Singh IJ & Chib M. A preliminary checklist of butterflies (Lepidoptera: Rhopalocera) of Mendrelgang, Tsirang District, Bhutan, 2012.
- Sundufu A J. and Dumbuya R. Habitat preferences of butterflies in the Bumbuna forest, Northern Sierra Leone. *Journal of Insect Science*, 2008, 8 (64): 1-7
- Talbot G. *The Fauna of British India including Ceylon and Burma. Butterflies - 2nd Edition. Vol. I.* Taylor and Francis Ltd., London, UK, 1939.
- Van der Poel P. and Wangchuk T. *Butterflies of Bhutan. Mountain, hills and valleys between 800 and 300m*. Royal Society for Protection of Nature (RSPN). Thimphu Bhutan. Printed in Colombia by Pamamericana Formase Impresos S.A. 2007.
- Tempa T., Norbu N., Dendup P. and Nidup T. *Results from a camera trapping exercise for estimation tiger population size in the lower foothills of Royal Manas National Park*. UWICE and RMNP: RGoB. Lamai Gompa, Bumthang, 2011.
- Venkataraman M. *A concise guide to Indian insects and arachnida*. Publied by Simova Education and Research 48, Yamunabai road, Madhavanagar, highground, Bangalor 560 001, India, 2010.
- Wangdi S., Wangdi K., Sherub, Wangdi R., Drukpa S. Harada M., Aoki T., Amaguchi S., Saito M., Igarashi Y, Watanabe. Y., and Yago M. Butterflies of Tashiyangtse Valley, Eastern Bhutan, part 1, 2012.
- Wangdi K. and Shrub. *Nature guide series. Nymphalids, Brush-footed Butterflies of Bhutan*. Ugyen Wangchuk Institute for Conservation and Environment, Bumthang, 2012
- Wangdi, K. and Shrub. *Field Guide for Swallowtails of Bhutan*. Ugyen Wangchuk Institute for Conservation and Environment, Bumthang 2012.
- Evans W.H. The identification of Butterflies. Published by The Bombay Natural History Society. Printed at the Diocesan press, Madras, 1927.

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<http://www.discovery.org.in/springjournal.htm>