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Research Article

Butterflies in two Conservation Gradient Landscapes of Manas Biosphere Reserve, Assam, India

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ABSTRACT

A survey was conducted on the butterfly fauna in two distinct conservation gradient landscapes within the Manas Biosphere Reserve. A total of 250 butterfly species were documented, representing 140 genera distributed among six different families. Raimona National Park boasting the highest level of protection, it exhibited lower species richness, documenting 228 species in contrast to Chirang Reserve Forest, which recorded 243 species. Among the butterflies in both protected areas, the Nymphalidae family exhibited the highest number of genera, totaling 47, followed by Lycaenidae with 38 genera, Hesperiidae with 34 genera, Pieridae with 13 genera, Papilionidae with 7 genera, and Riodinidae with 2 genera. Remarkably, seven species fall within the categories of both Schedule-I and Schedule-IV, while an additional 41 species listed in Schedule-II are granted federal protection. Considering the situation, the government should seriously consider integrating the reserve into the national park. This move would significantly bolster the protection and preservation of the butterfly habitat and its diverse ecosystem.

Key words: Butterfly, landscape, conservation, national park, protection, ecosystem

INTRODUCTION

Insects are pivotal in ecosystems, whether in their pristine or human-altered states, and are indispensable for maintaining environmental well-being. They provide a diverse array of ecosystem services, with far-reaching implications for aspects of human life such as agriculture, tourism, and the sustainable use of natural resources (Samways, 1994; Tscharntke *et al*., 2005). Among the insects, members of the order Lepidoptera, butterflies can be found in nearly all types of habitats all over the world (Pennisi, 2004). Numerous research endeavors have demonstrated that butterflies serve as reliable indicators of environmental shifts and the influence of human activities due to their sensitivity to alterations within ecosystems (Kwon *et al*., 2010; Manzoor & Sadat, 2013; Jemal & Patharajan, 2018). Additionally, butterflies play a crucial role as pollinators (Cox *et al*., 2020), and their decline can have negative consequences. The distribution and abundance of butterflies are intimately intertwined with plant life, underscoring their pivotal role in preserving plant species and the overall health of ecosystems (Kitahara *et al*., 2008; Van Halder *et al*., 2008; Mahata & Palita, 2023). There is an evident and progressive decline in butterfly diversity, as highlighted by Tscharntke *et al*. (2005). The principal factor contributing to this decline in diversity is predominantly human-induced activities occurring within and in the vicinity of their habitats (Pennisi, 2004). In the work by Brown (1997), it was noted that plants have a significant influence on butterfly biodiversity. The study underscored that the assessment of ecosystem diversity is contingent upon the interactions among species and their integration with the surrounding physical environment.

The aim of this study is to evaluate and make comparisons regarding the species richness of butterflies within two distinct conservation gradient landscapes, namely Raimona National Park and Chirang Reserve Forest under Manas Biosphere Reserve.

MATERIALS AND METHODS

Study Area

Raimona National Park and Chirang Reserve, together spanning 590 square kilometers, are situated in the western part of the Manas Biosphere Reserve in Assam, India. Before its designation as a national park in 2021, Raimona was previously referred to as Ripu Reserve, with its eastern part linked to the current Chirang Reserve. The northern section of these protected areas shares a border with Phipsu Wildlife Sanctuary in Bhutan. To the east, the Bhur River acts as a natural demarcation, while the Sankosh River forms the western boundary. In the case of the park boundary, the southern limit extends up to Ridgeline 6 (the term was used by the Britishers for forest management), while for the reserve, it is expanded until National Highway-31. The Hel River demarcates the National Park and the Chirang Reserve. The area is located in the Bhabhar tract, known for its rock and boulder deposits and low groundwater levels, with a mean sea level ranging from 60 to 150 meters. The park features a diverse range of forest types, from moist sal and sub-Himalayan high alluvial semi-evergreen forests to savannah and riparian fringing forests (Champion & Seth, 1968).

Within the study area, there are four notable rivers: Sonkosh, Pekua, Hel, and Saralbhanga, accompanied by their respective tributaries. However, it is common for these rivers to encounter reduced water levels during the dry season. The soil in the park is mostly dry sandy loam with a thin layer of humus and frequent surface stones. The temperature in the region fluctuates

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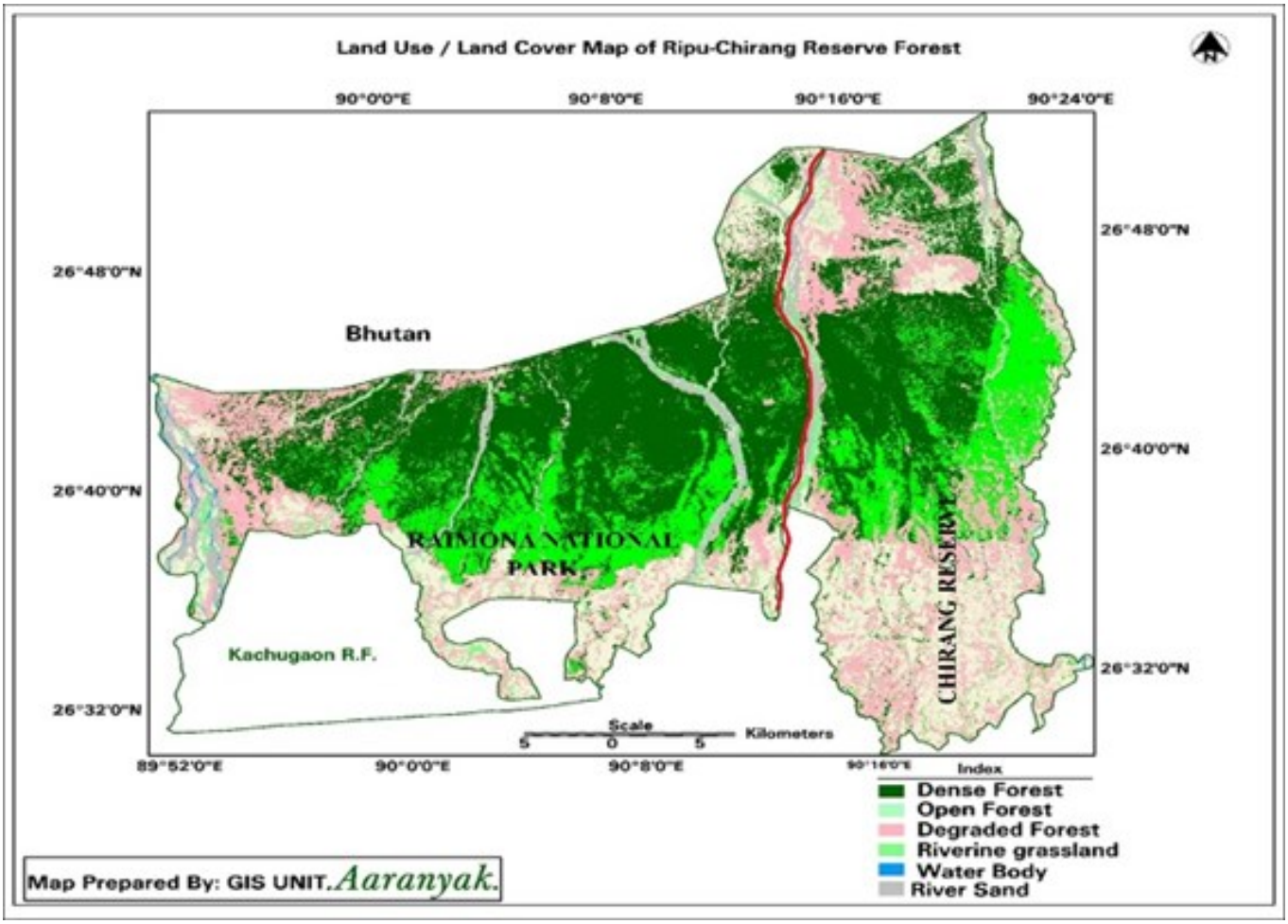

Figure 1. Map of Raimona National Park (RNP) and Chirang Reserve Forest (CRF)

between a minimum of 7°C and a maximum of 34°C. Additionally, the park receives varying levels of rainfall throughout the year, with the winter season receiving as little as 15mm and the monsoon season receiving as much as 1162mm.

Survey methods

Surveys was carried out on sunny days in between 9am to 4pm by walking in various habitats, including near water sources, near damp patches, open areas, blossoming flowers, ripe fruits, at puddles. In order to locate cryptic butterfly species, opportunistic surveys were conducted in down and dusk. Additionally, searches were conducted in the catchment areas of streams, and from top to bottom of streams to record the maximum number of species. Photographs of butterflies were taken from different angles to enable correct identification of species. The identification keys of Evans (1932), Talbot (1947), Haribal (1992), and photographic guides of Kehimkar (2008) were used to identify the butterfly species. To compare past and present status we compared the present and past statuses using Evans' (1932) literature and our recent survey data.

The local conservation status is classified into four categories: Rare (R), Common (C), Occasional (O), and Frequent (F). Rare species are those that are seldom encountered or have a very low occurrence rate within a given area or population. These are typically considered to be at risk or vulnerable, and conservation efforts may be needed to protect them. Common species are those that are regularly encountered or have a high occurrence rate within a specific area or population. They are widespread and abundant, and their presence is expected in a given context. Occasional species fall between rare and common. They are not as rare as truly rare species but are not as abundant as common ones. They are encountered periodically but not all the time. Frequent species are those that are encountered very often or have a high occurrence rate within a specific area or population. They are highly abundant and are regularly observed.

RESULTS AND DISCUSSION

A total of 250 butterfly species, spanning 140 distinct genera and six unique families, were documented within Raimona National Park and Chirang Reserve (Fig 2). The recorded species were 26 from Papilionidae (10.4%), 55 from Lycaenidae (22%), 92 from Nymphalidae (36.8%), 26 from Pieridae (10.4%), 48 from Hesperiidae (19.2%), and 3 from Riodinidae (1.2%). Nymphalidae had the highest number of genera (47) among the butterflies, followed by Lycaenidae (38), Hesperiidae (34), Pieridae (13), Papilionidae (7), and Riodinidae (2) in both the protected areas. These findings align with the observations made by Gogoi *et al*. (2014); Upadhyay *et al*. (2023) and Choudhury (2020), where these families were noted as the most extensive within the Lepidoptera order. When comparing Raimona National Park and Chirang Reserve Forest, a total of 228

butterfly species were observed in Raimona National Park. Among these, 23 species were from the Papilionidae family, 48 from Lycaenidae, 87 from Nymphalidae, 43 from Hesperiidae, 25 from Pieridae, and 2 from Riodinidae. In contrast, Chirang Reserve Forest recorded 243 species, which was a higher count than that of Raimona National Park. This included 24 species from Papilionidae, 55 from Lycaenidae, 89 from Nymphalidae, 46 from Hesperiidae, 26 from Pieridae, and 3 from Riodinidae (Fig. 3).

The study identified several butterfly species that are safeguarded according to the Indian Wildlife (Protection) Amendment Act of 2022. Seven of these species were classified as Schedule-I. Forty-one species were categorized as Schedule-II. Additionally, the study found seven butterfly species that were listed under Schedule-IV (Table 1). In Guma Reserve Forest of lower Assam, a similar trend of species richness was recorded (Choudhury, 2020), while Sethy (2014) reported a comparable trend in the South-Eastern part of Namdapha Tiger Reserve, Arunachal Pradesh, and Bhowmik & Chowdhury (2021) observed a similar trend in Tripura. Both protected areas share a similar geographical location and nearly identical vegetation types. Prior to being declared Raimona as a National Park in 2021, both areas experienced significant anthropogenic disturbances, including clearing forests for agriculture, illegal human settlements, cattle farming, firewood collection, and unscientific forest fires.

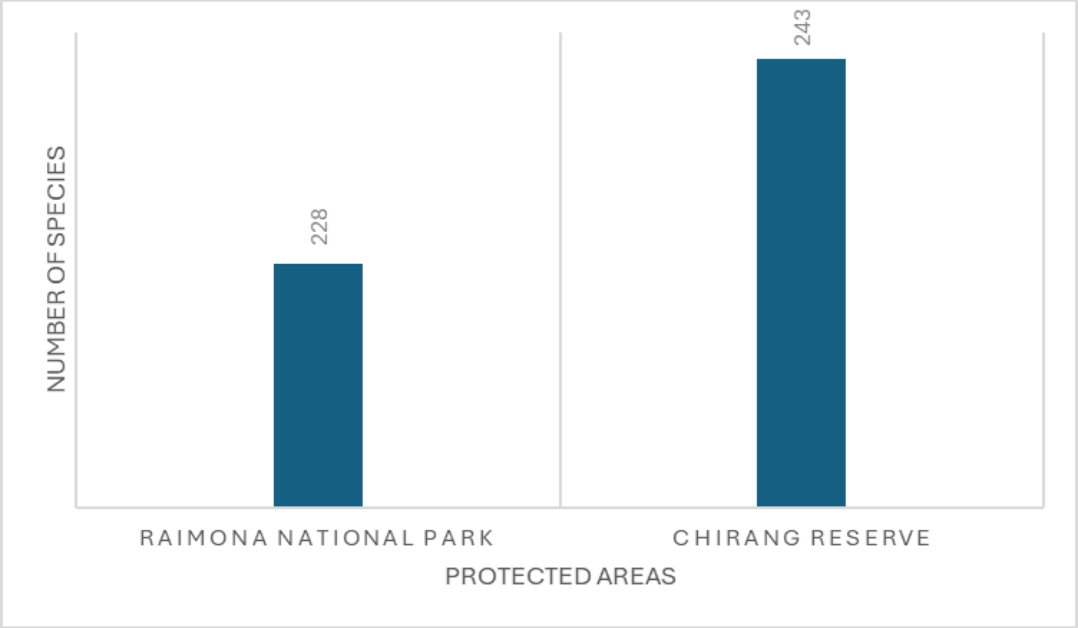

Figure 2. Butterfly richness between Raimona National Park and Chirang Reserve Forest

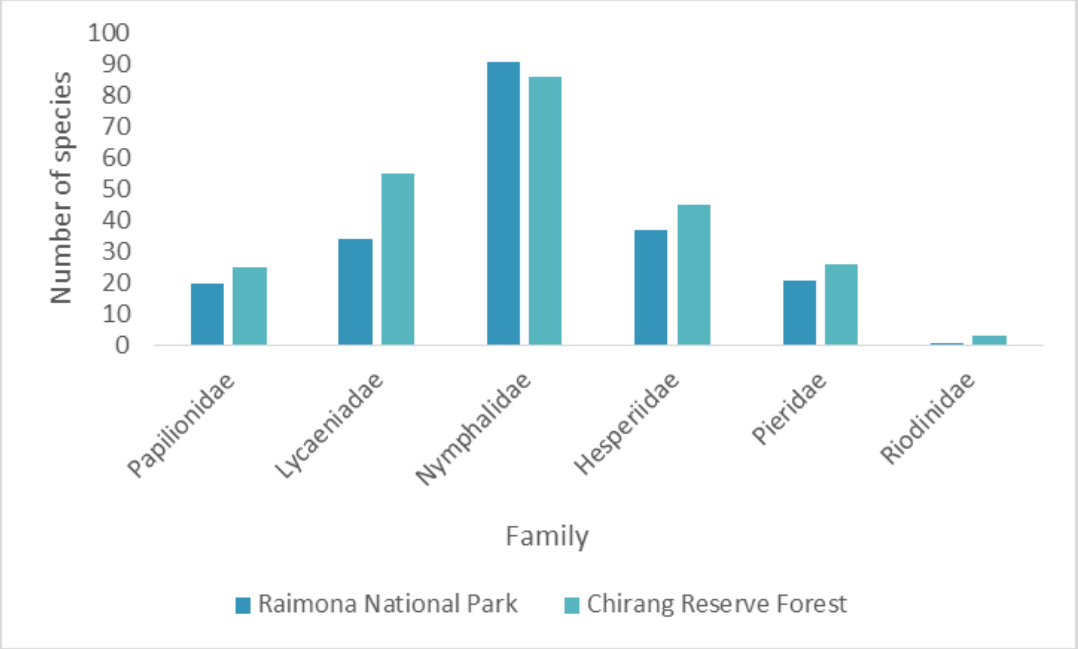

Figure 3. Family-wise representation of butterfly species in Raimona National Park and Chirang Reserve Forest.

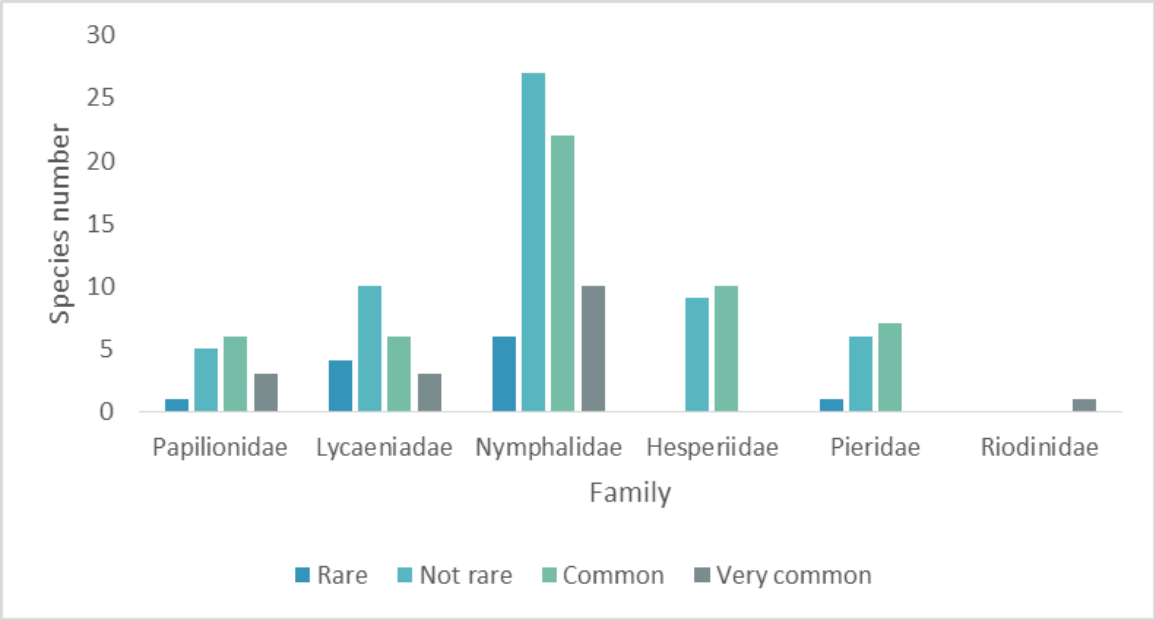

Figure 4 . Species recorded in Raimona National Park and Chirang Reserve Forest with their status followed by Evans in 1932.

The western boundaries, connected to West Bengal, faced rampant illegal cutting and collection of timber. The observed lesser variety of butterflies in Raimona National Park may be linked to the isolated nature of the forest area and the impacts of habitat fragmentation on biodiversity (Fahrig, 2003). Additionally, the challenge of reaching bordering areas due to insurgency issues might be a probable factor contributing to the lower count of species during intensive surveys. Fig 3: Family-wise representation of butterfly species in Raimona National Park and Chirang Reserve Forest.

Table 1 presents a comparison between the historical and current butterfly statuses, following the methodology outlined by Evans (1932) and incorporating the findings of the present survey. Evans (1932) classified Indian butterflies into four categories based on their abundance: rare, not rare, common, and very common. Out of the sampled butterflies, 12 species were categorized as rare, including one species from Papilionidae, four species from Lycaenidae, six from Nymphalidae and only one from the family Hesperiidae. On the other hand, 57 species of butterflies were classified as not rare, including five species from Papilionidae, 10 species from Lycaenidae, 27 number of species from the family Nymphalidae, nine species from Hesperiidae, and six are from Pieridae, 52 species fall under common in which 6 species from Papilionidae, six species from Lycaenidae, and 21 species from the family Nymphalidae and 17 species from the family Hesperiidae. Besides, 17 species fall under the category very common out of which 3 species from Papilionidae, three species from Lycaenidae, where 10 species from Nymphalidae and only one species belonging to the family Riodinidae shown in the (Fig 4). In contrast, a total of 45 butterfly species have been documented in the Chirang Reserve Forest (CRF) that were not found in Raimona National Park (RNP). In RNP, only nine butterfly species were recorded, and these particular species were not observed in the CRF.

As per the present conservation status 7 species are rare, 54 are occasional, 133 are frequent and 54 are common, among them under the family Papilionidae 4 species are rare, 10 species are occasional, 3 species are and 9 species are common; from Lycanidae family none of the species were found rare, 12 species are occasional, and 33 species are frequent; from Nymphalidae family only one species were arranged under rare, 19 species are occasional, and 54 species are frequent, 17 species are common; from Pieridae 2 species are rare, 2 species are occasional and 9 species are frequent, 13 species are common, from Hespieriidae no rare species recorded, 9 species are occasional and 33 species are frequent, 6 species are common; furthermore, from Riodinidae no rare and common species found, but 2 species are occasional and one frequent species were recorded.

The study highlights that both protected areas have immense conservation potential, especially regarding its diverse butterfly fauna. The richness of butterfly species signifies a thriving ecosystem crucial for biodiversity and ecological equilibrium. With Ripu being upgraded to a National Park, there is heightened protection for its fauna and flora compared to the Chirang Reserve. The Chirang Reserve is home to an impressive 240 butterfly species, underscoring its significance. Tourism plays a vital role in promoting the growth of local communities, but its impacts can be detrimental without efficient management. Saralpara has recently gained popularity as a picnic spot within the Chirang Reserve due to its captivating scenic beauty. However, this surge in visitors is concerning, with an estimated 100 or more vehicles passing through the reserve. This increased vehicular traffic could have a detrimental effect on the local wildlife, including the butterfly fauna. A previous study by Choudhury & Ghosh (2008) have underscored the negative impact of vehicular traffic on butterflies within the Chirang Reserve. These findings emphasize the urgent need to address and mitigate the potential ecological consequences of this growing human activity within the reserve. Considering this, integrating the Chirang Reserve into Raimona National Park would provide enhanced safeguarding for butterflies and other wildlife, ensuring their long-term preservation and protection. This strategic amalgamation would contribute to a more comprehensive and robust conservation effort.

Table 1. The butterfly species recorded in both Raimona National Park and Chirang Reserved Forest, along with their status as per Evans (1932), their local conservation status, and their legal protection status under the Wildlife (Protection) Amendment Act of 1972. (A– Absent and P– Present)

Sl. No.	Family	Scientific name	Common name	Raimona NP	Chirang RF	Evans status (1932)	Local status	Wildlife (Protection) Amended Act 1972
1	Papilionidae	*Atrophaneura aidoneus*	Lesser Batwing	P	P	Rare	R	-
2		*Atrophaneura varuna*	Common Batwing	P	P	Not Rare	O	-
3		*Chilasa clytia*	Common Mime	P	P	Not mentioned	O	Schedule II
4		*Graphium agammemnon*	Tailed Jay	P	P	Common	C	-
5		*Graphium agetes*	Fourbar Swordtail	P	P	Not mentioned	O	Schedule II
6		*Graphium doson*	Common Jay	P	P	Not mentioned	C	-
7		*Graphium macareus*	Lesser Zebra	A	P	Not mentioned	C	Schedule II
8		*Graphium nomius*	Spot Swordtail	A	P	Not mentioned	O	-
9		*Graphium sarpedon*	Common Bluebottle	P	P	Not mentioned	C	-
10		*Graphium xenocles*	Great Zebra	P	P	Not Rare	R	-
11		*Pachliopta aristolochiae*	Common Rose	P	P	Very Common	O	-
12		*Papilio alcmenor*	Red Breast	A	P	Not mentioned	O	-
13		*Papilio castor*	Common Raven	P	P	Not Rare	F	-
14		*Papilio demoleous*	Lime Butterfly	P	P	Not mentioned	C	-
15		*Papilio elephenor*	Yellow Crested Spangle	P	A	Not mentioned	R	Schedule I
16		*Papilio helenus*	Red Helen	P	P	Common	C	-
17		*Papilio memnon*	Great Mormon	P	P	Common	F	-
18		*Papilio nephelus*	Yellow Helen	P	P	Common	C	-
19		*Papilio paris*	Paris Peacock	P	P	Common	F	-
20		*Papilio polyctor*	Common Peacock	A	P	Common	R	-
21		*Papilio polytes*	Common Mormon	P	P	Very common	C	-
22		*Papilio protenor*	Spangle	P	P	Very common	O	-
23		*Pathysa antiphates*	Fivebar Swordtail	P	P	Not mentioned	C	-
24		*Pathysa aristeus*	Chain Swordtail	A	P	Not mentioned	O	-
25		*Triodes aeacus*	Golden Birdwing	A	P	Not Rare	O	Schedule II
26		*Triodes helena*	Common Birdwing	P	P	Not Rare	O	-

27		*Acytolepis puspa*	Common Hedge Blue	P	P	Not mentioned	F	-
28		*Anthene emolus*	Common Ciliated Blue	P	P	Not mentioned	C	-
29		*Anthene lycaenina*	Pointed Ciliated Blue	A	P	Not mentioned	C	-
30		*Arhopala amantes*	Large Oakblue	A	P	Not mentioned	O	-
31		*Arhopala silhetensis*	Sylhet Oakblue	A	P	Rare	O	Schedule II
32		*Arhopala atrax*	Indian Oakblue	P	P	Not mentioned	F	-
33		*Arhopala dispar*	Frosted Oakblue	A	P	Rare	O	-
34		*Bindahara phocides*	Plane	A	P	Not mentioned	F	Schedule II
35		*Caleta elna*	Elbowed Pierrot	P	P	Very common	C	-
36		*Castalius rosimon*	Common Peirrot	P	P	Not mentioned	O	-
37		*Catochrysops panormus*	Silver Forget-Me-Not	P	P	Not mentioned	F	-
38		*Catochrysops strabo*	Forget-Me-Not	P	P	Uncommon	F	-
39		*Celastrina cardia*	Pale Hedge Blue	P	P	Not Rare	F	-
40	Lycaeniadae	*Cheritraa freja*	Common Imperial	A	P	Not Rare	C	-
41		*Chilades laius*	Lime Blue	P	P	Common	C	-
42		*Chliaria othona*	Orchid Tit	P	P	Rare	O	-
43		*Curetis bulis*	Bright Sunbeam	P	P	Not Rare	F	-
44		*Curetis dentate*	Angled Sunbeam	A	P	Not mentioned	O	-
45		*Euchrysops cnejus*	Gram Blue	A	P	Not mentioned	F	-
46		*Everes lacturnus*	Indian Cupid	P	P	Not mentioned	F	-
47		*Shijimia moorei*	Moore's Cupid	A	P	Not mentioned	O	Schedule I
48		*Heliophorus epicles*	Purple Sapphire	P	P	Common	C	-
49		*Horaga onyx*	Common Onyx	A	P	Not Rare	F	-
50		*Horaga viola*	Brown Onyx	A	P	Not mentioned	O	-
51		*Hypolycaena erylus*	Common Tit	P	P	Common	C	-
52		*Jamides alecto*	Metallic Cerulean	A	P	Not mentioned	C	Schedule II
53		*Jamides bochus*	Dark Cerulean	P	P	Not mentioned	F	-
54		*Lampides boeticus*	Pea Blue	P	P	Not mentioned	F	Schedule II
55		*Leptotes plinius*	Zebra Blue	A	P	Not mentioned	F	-
56		*Loxura atymnus*	Yamfly	P	P	Common	F	-
57		*Megisba malaya*	Malayan	P	P	Not Rare	F	Schedule II
58		*Nacaduba beroe*	Transparent 6-Line Blue	A	P	Not mentioned	F	-
59		*Nacaduba hermus*	Large 4-line Blue	A	P	Not mentioned	F	Schedule II
60		*Neopithecops zalmora*	Quaker	P	P	Common	F	-
61		*Nilasera centaurus*	Centaur Oakblue	P	P	Not rare	F	-

62		*Poritia hewitsoni*	Common Gem	P	P	Not Rare	O	Schedule II
63		*Prosotas aluta*	Banded Lineblue	P	P	Rare	F	-
64		*Prosotas dubiosa*	Tailless Line Blue	A	P	Common	F	Schedule II
65		*Prosotas nora*	Common Lineblue	P	P	Not mentioned	F	-
66		*Pseudozizeeria maha*	Pale Grass Blue	P	P	Very Common	F	-
67		*Rapala airbus*	Indian Red Flash	P	P	Not mentioned	F	-
68		*Rapala nissa*	Common Flash	P	P	Not mentioned	F	-
69		*Rapala pheretima*	Copper Flash	A	P	Not rare	F	-
70		*Sinthusa chandrana*	Broad Spark	P	P	Not Rare	R	Schedule II
71		*Spindasis lohita-himalayanus*	Long Banded Silverline	A	P	Not mentioned	C	Schedule II
72		*Spindasis syama*	Club Silverline	A	P	Not mentioned	F	-
73		*Surendra quercetorum*	Common Acacia Blue	P	P	Not mentioned	F	-
74		*Surendra todara*	Silverstreaked Acacia Blue	P	P	Not mentioned	O	Schedule II
75		*Syntarucus plinius*	Zebra Blue	P	P	Not mentioned	O	-
76		*Taraka hamada*	Forest Pierrot	P	P	Not Rare	F	-
77		*Tarucus ananda*	Dark Pierrot	A	P	Not mentioned	F	Schedule IV
78		*Tarucus nara*	Striped Pierrot	A	P	Not mentioned	O	-
79		*Zeltus amasa*	Fluffy Tit	P	P	Not Rare	F	-
80		*Zizeeria karsandra*	Dark Grass Blue	P	P	Not mentioned	F	-
81		*Zizeeria maha*	Pale Grass Blue	P	P	Very Common	F	-
82	Nymphalidae	*Acraea violae*	Tawny Coster	P	A	Not mentioned	O	-
83		*Ariadne ariadne*	Angle Castor	P	A	Not mentioned	C	-
84		*Ariadne merione*	Common Castor	P	P	Common	C	-
85		*Athyma nefta*	Colour Sergeant	P	P	Not Rare	C	-

86	*Athyma pravara*	Unbroken Sergeant	P	P	Rare	F	Schedule II
87	*Athyma selenophora*	Staff Sergeant	P	P	Not Rare	F	-
88	*Cethosia bibles*	Red Lacewing	P	P	Common	F	Schedule II
89	*Cethosia cyane*	Leopard Lacewing	P	P	Not Rare	F	-
90	*Charaxes kahruba*	Variegated Rajah	P	P	Rare	O	Schedule II
91	*Charaxes marmax*	Yellow Rajah	P	P	Rare	C	Schedule II
92	*Charaxes polyxena*	Tawny Rajah	P	P	Not mentioned	C	Schedule II
93	*Chersonesia risa*	Common Maplet	P	P	Not Rare	F	-
94	*Cirrochroa aoris*	Large Yeomen	P	P	Not mentioned	F	-
95	*Cirrochroa tyche*	Common Yeomen	P	P	Common	F	-
96	*Cynthia cardui*	Painted Lady	P	P	Not mentioned	F	-
97	*Cyrestis thyodamas*	Common Map	P	P	Common	O	-
98	*Danaus chrysippus*	Plain Tiger	P	P	Very Common	F	-
99	*Danaus genutia*	Striped Tiger	P	P	Very Common	F	Schedule I
100	*Dichorragia nesimachus*	Constable	P	P	Not Rare	O	-
101	*Doleschallia bisaltide*	Autumn Leaf	P	P	Not Rare	O	Schedule II
102	*Elymnias basudeva*	Jezebel Palm Fly	P	P	Not mentioned	O	Schedule II
103	*Euploea algae*	Long Banded Blue Crow	P	P	Not mentioned	F	Schedule II
104	*Euploea core*	Common Crow	P	P	Common	F	Schedule IV
105	*Euploea klugii*	Blue King Crow	P	P	Not mentioned	O	-
106	*Euploea midamus*	Blue Spotted Crow	P	P	Rare	F	Schedule II
107	*Euploea mulciber*	Striped Blue Crow	P	P	Common	F	Schedule IV
108	*Euploea radmanthus*	Magpie Crow	P	P	Not Rare	F	-
109	*Euploea sylvester*	Double Branded Crow	P	P	Not mentioned	F	-
110	*Euripus halitheres*	Courtesan	P	P	Not mentioned	F	Schedule II
111	*Euthalia aconthea*	Common Baron	P	P	Not Rare	F	Schedule II
112	*Euthalia alpheda*	Streaked Baron	P	P	Not mentioned	F	-
113	*Euthalia monina*	Powder Baron	P	P	Not Rare	F	Schedule I
114	*Euthalia telchinia*	Blue Baron	P	P	Not mentioned	F	Schedule I
115	*Herona marathus*	Pasha	P	P	Not Rare	O	Schedule II
116	*Hestina nama*	Circe	P	P	Not Rare	F	-
117	*Hypolimnas bolina*	Great Eggfly	P	P	Common	F	-
118	*Hypolimnas misippus*	Danaid Eggfly	P	P	Not Rare	F	Schedule I

119	*Kallima inachus*	Orange Oakleaf	P	P	Not Rare	O	-
120	*Lasippa viraja*	Yellowjack Sailer	P	P	Not mentioned	O	Schedule II
121	*Lebadea martha*	Knight	P	P	Not mentioned	F	-
122	*Lexias dirtea*	Dark Archduke	P	P	Not Rare	O	Schedule II
123	*Libythia myrrha*	Club Beak	P	P	Not mentioned	O	-
124	*Limenitis danava*	Commodore	P	P	Not mentioned	F	Schedule II
125	*Melanitis leda*	Common Evening Brown	P	P	Very Common	F	-
126	*Melanitis phedima*	Dark Evening Brown	P	P	Common	F	-
127	*Melanitis zitenius*	Great Evening Brown	P	P	Not Rare	F	Schedule II
128	*Moduza procris*	Commandore	P	P	Not Rare	F	-
129	*Mycalesis anaxias*	White bar Bushbrown	P	P	Not mentioned	F	Schedule II
130	*Mycalesis malsara*	White line Bushbrown	P	P	Not mentioned	F	-
131	*Mycalesis mineus*	Darkbrand Bushbrown	P	P	Very Common	F	Schedule II
132	*Mycalesis perseus*	Common Bushbrown	P	P	Very Common	C	-
133	*Mycalesis visala*	Longbrand Bushbrown	P	P	Common	F	-
134	*Neptis ananta*	Yellow Sailor	P	P	Rare	F	-
135	*Neptis clina*	Clear Sailor	P	P	Rare	F	Schedule II
136	*Neptis harita*	Dingiest Sailer	P	P	Not rare	R	-
137	*Neptis hylas*	Common Sailor	P	P	Very Common	C	-
138	*Neptis miah*	Small Yellow Sailor	P	P	Not Rare	F	-
139	*Neptis pseudovikasi*	False Dingy Sailor	P	P	Not Rare	F	-
140	*Neptis soma*	Sullied Sailor	P	P	Rare	F	-
141	*Neptis yerburii*	Yerbury Sailer	P	A	Not mentioned	O	-
142	*Orsotrioena medus*	Nigger	P	P	Not mentioned	F	-
143	*Pantoporia hordonia*	Common Lascar	P	P	Common	F	-
144	*Pantoporia paraka*	Perak Lascar	P	P	Not mentioned	R	-
145	*Parantica aglea*	Glassy Tiger	P	P	Common	C	-
146	*Parantica melaneus*	Chocolate Tiger	P	P	Common	F	-
147	*Parantica sita*	Chestnut Tiger	P	P	Not Rare	F	-
148	*Parathyma perius*	Common Sergeant	P	P	Common	F	-
149	*Parathyma ranga*	Black vein Sergeant	P	P	Rare	F	-
150	*Phaedyma columella*	Short banded Sailor	P	A	Not Rare	F	-

160		*Rohana parisatis*	Black Prince	P	P	Not mentioned	O	-
161		*Sephisa chandra*	Eastern Courtier	P	A	Not mentioned	O	-
162		*Stibochiona nicea*	Popinjay	P	P	Not Rare	O	-
163		*Symbrenthia lilea*	Common Jester	P	P	Common	F	-
164		*Tanaecia julil*	Common Earl	P	P	Common	F	-
165		*Tanaecia lepidea*	Grey Count	P	P	Not Rare	F	Schedule II
166		*Tirumala limniace*	Blue Tiger	P	P	Very Common	F	-
167		*Tirumala septentrionis*	Dark Blue Tiger	P	P	Very Common	F	-
168		*Vagrans egista*	Vagrant	P	P	Not Rare	O	-
169		*Vanessa indica*	Indian Red Admiral	P	P	Common	F	-
170		*Vindula erota*	Cruiser	P	A	Not Rare	F	-
171		*Ypthima asterope*	Common Three ring	P	P	Not mentioned	C	-
172		*Ypthima baldus*	Common Fivering	P	P	Very Common	C	-
173		*Ypthima hubenri*	Common Fourring	P	P	Very Common	C	-
174	Hesperiidae	*Ampittia dioscorides*	Bush Hopper	P	P	Not mentioned	F	-
175		*Ancistriodes nigrita*	Chocolate Demon	P	P	Common	F	-
176		*Badamia exclamationis*	Brown Awl	P	P	Common	O	-
177		*Bibasis sena*	Orangetail Awl	P	P	Not mentioned	O	Schedule II
178		*Borbo cinnara*	Rice Swift	P	P	Common	F	-
179		*Burara amara*	Small Green Awlet	P	P	Not mentioned	O	-
180		*Caltoris kumara*	Blank Swift	P	P	Not mentioned	F	-
181		*Caprona alida*	Yellow Spotted Angle	A	P	Not mentioned	O	-
182		*Celaenorrhinus aurivittata*	Dark Yellow Banded Flat	P	A	Not Rare	F	-
183		*Celaenorrhinus leucocera*	Common Spotted Flat	P	P	Common	F	-
184		*Choaspes benjaminii*	Indian Awl King	P	P	Not Rare	F	-
185		*Choaspes furcate*	Hooked Awlking	A	P	Not mentioned	O	-
186		*Coladenia agni*	Brown Pied Flat	P	P	Not mentioned	F	-
187		*Cupitha purreea*	Wax Dart	P	P	Not Rare	F	-
188		*Gerosis bhagava*	Common Yellow-Breasted Flat	A	P	Not mentioned	F	-
189		*Gerosis phisara*	Dusky Yellow-breast Flat	A	P	Not Rare	F	-
190		*Hasora badra*	Common Awl	P	P	Not Rare	F	-
191		*Hasora chromus*	Common banded Awl	P	P	Not mentioned	F	-
192		*Hasora taminatus*	White Banded Awl	A	P	Not mentioned	F	-
193		*Hasora vitta*	Plain banded Awl	A	P	Not mentioned	F	-
194		*Hyarotis adrastus*	Tree Flitter	P	P	Not Rare	F	Schedule IV

195		*Iambrix salsala*	Chestnut Bob	P	P	Common	C	-
196		*Koruthaialos butleri*	Dark Velvet Bob	P	P	Rare	F	-
197		*Matapa aria*	Common Redeye	P	P	Not mentioned	F	-
198		*Mooreana trichoneura*	Yellow Flat	P	P	Not mentioned	F	-
199		*Notocrypta curvifascia*	Restricted Demon	P	P	Common	C	-
200		*Ochus atkinsoni*	Tiger hopper	P	P	Not mentioned	C	-
201		*Odontoptilum angulata*	Chestnut Angle	P	P	Not Rare	F	-
202		*Oriens gola*	Common Dartlet	P	P	Not Rare	F	-
203		*Parnara bada*	African Straight Swift	A	P	Not mentioned	F	-
204		*Parnara ganga*	Continental Swift	P	P	Not mentioned	F	-
205		*Parnara guttatus*	Straight Swift	A	P	Common	F	-
206		*Pelopidas assamensis*	Great Swift	P	P	Not mentioned	O	Schedule IV
207		*Pelopidas conjuncta*	Conjoined Swift	P	A	Not mentioned	F	-
208		*Pelopidas mathias*	Small Banded Swift	P	P	Not mentioned	F	-
209		*Pelopidas sinensis*	Large branded Swift	A	P	Not mentioned	O	-
210		*Polytremis eltola*	Yellow Spot Swift	P	P	Not mentioned	F	-
211		*Polytremis lubricans*	Contiguous Swift	P	P	Not mentioned	O	Schedule IV
212		*Potanthus confucius*	Chinese Dart	A	P	Not mentioned	O	-
213		*Potanthus nesta*	The Dart	P	P	Not mentioned	C	-
214		*Psuedocoladenia dan*	Fulvous Pied Flat	P	P	Not mentioned	C	-
215		*Sancus fuligo*	Coon	P	P	Not mentioned	C	-
216		*Sarangesa dasahara*	Common Small Flat	P	P	Common	F	-
217		*Sesseria sambara*	Sikkim White Flat	P	P	Not Rare	F	-
218		*Spialia galba*	Indian Skipper	P	P	Common	F	-
219		*Tagiades gana*	Suffused Snow Flat	A	P	Not Rare	F	-
220		*Tagiades litigiosa*	Water Snow Flat	P	P	Not mentioned	F	-
221		*Udaspes folus*	Grass Demon	P	P	Common	F	-
222	Pieridae	*Appias albina*	Common Albatross	P	P	Not mentioned	F	Schedule II
223		*Appias indra*	Plain Puffin	P	P	Not mentioned	O	Schedule II
224		*Appias lalage*	Spot Puffin	P	P	Not Rare	O	-
225		*Appias libythea*	Striped Albatross	P	P	Not mentioned	F	Schedule IV
226		*Appias lyncaida*	Chocolate Albatross	P	P	Common	C	Schedule II
227		*Catopsilia pomona*	Common Emigrant	P	P	Common	C	-
228		*Catopsilia pyranthe*	Mottled Emigrant	P	P	Common	C	-

229		Cepora nadina	Lesser Gull	P	P	Not Rare	C	Schedule II
230		Cepora nerissa	Common Gull	P	P	Common	C	-
231		Colias fieldii	Dark Clouded Yellow	A	P	Not mentioned	R	-
232		Delias aglaia	Redbreast Jezebel	A	P	Not Rare	F	-
233		Delias agostina	Yellow Jezebel	P	P	Not Rare	F	-
234		Delias descombesi	Red Spot Jezebel	P	P	Not Rare	F	-
235		Delias eucharis	Common Jezebel	P	P	Not mentioned	F	-
236		Delias hyparete	Painted Jezebel	P	P	Not mentioned	F	-
237		Dercas verhuelli	Tailed Sulphur	A	P	Not Rare	F	-
238		Eurema blanda	Three Spot Grass Yellow	P	P	Not mentioned	C	-
239		Eurema hecabe	Common Grass Yellow	P	P	Not mentioned	F	-
240		Eurema sari	Chocolate Grass Yellow	P	P	Not mentioned	C	-
241		Gandaka harina	Tree Yellow	P	P	Not mentioned	C	-
242		Hebomoia glaucippe	Great Orange Tip	P	P	Common	C	-
243		Ixias pyrene	Yellow Orange Tip	P	P	Common	C	-
244		Leptosia nina	Psyche	P	P	Common	C	-
245		Pieris brassicae	Large Cabbage White	A	P	Not mentioned	C	-
246		Pieris canidia	Indian Cabbage White	A	P	Not mentioned	C	-
247		Pontia daplidice	Bath White	P	P	Not mentioned	R	-
248	Riodinidae	Abisara bifasciata	Double-banded Judy	A	P	Not mentioned	O	-
249		Abisara echerius	Pulm Juddy	A	P	Not mentioned	O	-
250		Zemeros flegyas	Punchinello	P	P	Very common	F	-

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