

A CONTRIBUTION TO THE BUTTERFLY FAUNA OF MOULING NATIONAL PARK, ARUNACHAL PRADESH, NORTH EAST INDIA

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ABSTRACT

Out of two national parks in Arunachal Pradesh, the Mouling National Park encompassing a varied habitat is blessed with an unparalleled biodiversity. Its diversity in butterfly fauna is of scientific interest and is still little explored. Based on study of butterfly diversity in the park and its adjacent area falling under the south-western periphery of Dihang-Dibang Biosphere Reserve, the present paper is an attempt to prepare a checklist of the butterfly fauna of the park. The list includes 54 species belonging to 37 genera and 06 families out of which 07 species are new records to the state.

INTRODUCTION

Arunachal Pradesh, the erstwhile North East Frontier Agency (NEFA), which has been identified as one of the ecological hotspots in the world, is situated between 26°30' - 29°30'N and 91°30' - 97°30'E. Its unique status in biodiversity with the wildest spectrum of wildlife is attributed to its peculiar bio-geographical location, altitudinal variation and high rainfall. Owing to the varying agro-climatic and altitudinal conditions, the land supports a phenomenal range of biological diversity. These factors give rise to different climatic regimes and soil structure, which in turn determine the vegetation and faunal communities. Considering the high diversity in flora and fauna, the Government of Arunachal Pradesh has taken up conservation network action plan. An area of 10,079.14 km² constituting 12% of the total geographical area of the state has been brought under Protected Area Network (PAN) representing diverse ecosystems and wildlife habitats. Under the PAN, Mouling National Park, covering an area of 483 Km², is one of the important protected Area of the state. Incidentally, the state has

the highest coverage of PAN in India against the 4% of national figure.

REVIEW OF PAST WORK

A review of literature on the butterfly fauna of Arunachal Pradesh reveals that there is almost no record of works on butterfly exploration in Arunachal Pradesh before the British visited the area. The first impetus for exploration came with the establishment of British power in the Brahmaputra valley. Doubleday (1845) seems to be the first to work on butterfly in the state when he worked in northern Assam covering the areas of Sadia (this work encompassed plain area of present Lower Dibang Valley district of the state), Jorhat and Cachar followed by Moore (1857) who worked in Abor Hills and Mishmi Hills including Sadia. The celebrated work of Bingham (1905-1907) is also remarkable. The works of Evans (1912) on the Lepidoptera collected from the lower and middle belt of Abor Hills Tract during the British's Abor expedition in 1911-1912 encompasses the areas of mid-central part and south-eastern foothills of present

East Siang district as well as foothills of present Lower Dibang Valley district in the Mishmi Hills Tract. This was followed by South (1913) who worked on Lepidoptera collected by Capt. F.M. Bailey from Mishmi Hills Tract including Western China and South-Eastern Tibet during 1911. Tytler (1915) while working butterflies of Manipur and Naga Hills reported the Critically Endangered *Bhagadatta austenia purpurascens* from Abor Hills. While reviewing Bingham's series (1905-1907), Talbot (1939, 1947) worked in northern mountain districts of India that includes present North East India, covering lower basin of rivers Subansiri and Kameng of the then Balipara Frontier Tract which includes the lower belt of present districts of East Kameng, West Kameng and Lower Subansiri of Arunachal Pradesh.

After Indian Independence, Bettes (1950) worked in Balipara Frontier Tract and the Subansiri area (he mentioned as Northern Assam) covering the districts of present Papum Pare, Lower Subansiri and East Kameng and few from Sadia. Varshney and Chanda (1971) worked in Tirap and Changlang districts; Arora and Mondal (1981), Mandal (1985), Ghosh (1987) and Gupta and Shukla (1988) in various part of the state like district of Tirap, Changlang, Lohit, West Siang, Lower Subansiri, East and West Kameng, etc. and Namdapha National Park. Radhakrishnan (1988) in Tippi, West Kameng district; Athreya (1997, 2006) in Namdapha Tiger Reserve and Eaglenest Wildlife Sanctuary, etc. The works of Singh, D.N. *et al* (2002) is a compilation from Athreya (1997). Some authors mention the occurrence of many species in the state (Wynter-Blyth, 1957; D'Abbrera, 1982-1986; Haribal, 1992; Gupta and Mandal, 2005). Only the available literature on the butterfly fauna of the MNP and adjacent are Singh *et al* (1999), Choudhury Bordoloi and Borah (2003) and Borang *et al* (2008) reporting 3, 34 and 134 species and sub-species respectively from western peripheral area of Dihang Dibang Biosphere Reserve and adjacent which encompasses contiguous range of MNP.

MATERIAL AND METHODS

The study area

The Mouling National Park is one of the

important sites of wilderness in the Arunachal Pradesh. It lies approximately in between Longitude E 94° 42" to 95° 51" and Latitude N 28°28" to 28° 43" N. Jengging is the divisional headquarter and is located approximately at distance of about 25 Kms from the boundary of the Mouling National Park. Under the division the field offices are Jengging Wildlife range, Ramsing Wildlife range and Boleng Wildlife protected beat.

The park area is wolly a rugged mountainous terrain with altitudinal range varying from 750m to about 3000m, the Mouling peak being the highest with 3064m. The entire park is criss cross with numerous rivers and rivulets, these are Siring, Subbung, Kebung and Simang, which drain out and join the Siyom and ultimately Siang rivers. The climate is warmer in the hills cooler in the higher region. The temperature varies from Max 15-35° and Min 4-20°. The annual rainfall is usually more than 2500 mm per annum spreading over 8-9 months. This well distributed precipitation with high humidity rising up to 80% is conducive to the luxurious growth of vegetation, which in turn determines the faunal communities. The butterfly fauna best represents this. Ironically the butterfly diversity in the area is still not fully explored or understood.

METHODOLOGY

The present paper is based on the study of butterfly diversity in Mouling National Park undertaken by three authors. The evidences from published and unpublished literature (Singh *et al*, 1999) are also referred. Field collection trips were undertaken in Suple, Jengging, Ramsing, Janbo, Bomdo village site and Siring Hydel Station site of Mouling National Park and adjacent in accessible areas ranging from 550 to 2901m during June 2008 and July 2008.

The collection and preservation was done as per scheme suggested by Lefroy (1906), Pielle (1937), Wynter-Blyth (1957), Ghosh and Sengupta (1982) and Arora (1986). The collected specimen were put straight into envelopes in a flat box, after marking them with date, altitude and place of capture and the name, before finally putting them away into an air tight box containing a few naphthalene balls

and brought to Zoological field Station Itanagar Laboratory where relaxing and spreading of specimens have been done and then preserved in insect pinning boxes and deposited In ZSI Itanagar Museum for further study and reference..

Identification was done by referring standard literature namely Antram (1924), Evan (1932), Talbot (1939, 1947), Wynter-Blyth (1957), Arora and Mondol (1981), D'Abrera (1982-1986), Arora *et al* (1986) and Varshney and Shukla (1988). Out of total collection of 100 specimens 87 specimens have been identified making a total of 54 species/subspecies belonging to 37 genera and 06 families. Records of Singh *et al* (1999) Choudhury, Bordoloi and Borah (2003) and Borang *et al* (2008) have also been referred. The systematic and nomenclature, including sequence of orders and families are largely followed the scheme of Evans (1932) and D' Abrera (1982-1986). Other literature consulted are Antram, (1924), and Wynter-Blyth, (1957). An effort has been made to use the latest scientific and common names as far as possible for taxonomic reference after D' Abrera (1982-1986) and Varshney (1980, 1985, 1990). The altitude of locality is also given.

RESULTS AND DISCUSSION

A checklist of butterfly fauna of Moulin National Park has been prepared based on the study of butterfly diversity study undertaken by the present authors and available literature from the area (Table-1). A total of 54 species/subspecies belonging to 37 genera representing 06 families have been recorded out of which 07species/subspecies is new record to the state. The checklist has been presented in tabular form (Table-1). The reference codes for collector in the column-vi are given as 1 for present authors; 2 for Singh *et al* (1999); 3 for Choudhury Bordoloi and Borah (2003) and 4 for Borang *et al* (2008). The family Papilionidae dominated with 05 genera and 16 species, Nymphalidae with 14 genera and 15 species followed by Peridae with 10 genera and 14species and Lycaenidae comprising of 06 genera and 07 species and lastly Satyridae & Erycinidae with each 01 genera and 01 species.

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Table. 1:

LIST OF BUTTERFLIES COLLECTED FROM MOULING NATIONAL PARK.

SlNo.	Scientific Name	Common Name	Altitude (in m)	Reference
(i)	(ii)	(iii)	(iv)	(v)
I. Papilionidae				
1	<i>Triodes Helena cereberus</i>	Common Birdwing	500-900	1
2	<i>Triodes aecus</i>	Golden Birdwing	500-900	1, 3, 4
3	<i>Atrophaneura polyeuctes</i>	Common Windmill	600-1200	1, 3, 4
4	<i>Atrophaneura dasarada dasarada</i>	Great Windmill	600-1200	1,2, 4
5	<i>Papilio polyctor ganesa</i>	Common peacock	500-900	1
6	<i>Papilio paris paris</i>	Paris peacock	500-1200	1, 2, 3, 4
7	<i>Papilio Krishna</i>	Krishna peacock	500-1200	1,
8	<i>Papilio machaon sikkinensis*</i>	Common Yellow Swallowtail	500-900	1
9	<i>Papilio nephelus chaon</i>	Yellow Helen	500-1200	1, 4
10	<i>Papilio polytes Romulus</i>	Common Mormon	600-900	1
11	<i>Papilio memnon agenor</i>	Great Mormon	500-1200	1, 4
12	<i>Papilio alcmenor</i>	Red breast	500-1200	1
13	<i>Papilio janaka</i>	Tailed Red Breast	500-1200	1
14	<i>Graphium cloanthus</i>	Glassy Bluebottle	500-900	1, 3
15	<i>Graphium sarpedon sarpedon</i>	Common Bluebottle	500-900	1, 3, 4
16	<i>Lamproptera curius curius</i>	White Dragontail	500-900	1, 4

II. Pieridae				
17	<i>Leptosia nina nina</i>	Psyche	600-1200	1, 4
18	<i>Delias berinda*</i>	Dark Jezebel	500-1200	1
19	<i>Delias aglaia</i>	Redbase Jezebel	500-900	1
20	<i>Delias agostina agostina</i>	Yellow Jezebel	500-900	1
21	<i>Delias hyparete indica</i>	Painted Jezebel	500-1200	1
22	<i>Aporia agathon</i>	Great Blackvein	600-1200	1
23	<i>Artogeia canidia indica</i>	Indian cabbage White	500-900	1
24	<i>Cepora nerissa nerissa*</i>	Common Gull	500-1200	
25	<i>Appias indra</i>	Plain Puffin	600-900	1
26	<i>Ixias pyrene</i>	Yellow Orange Tip	500-900	1, 3, 4
27	<i>Dercas verhuelli</i>	Tailed Sulphur	500-900	1
28	<i>Pareronia avatar</i>	Pale Wanderer	500-900	1
29	<i>Pareronia valeria*</i>	Common Wonderer	500-900	1
30	<i>Eurema andersoni adersoni</i>	One spot grass yellow	500-1200	1
III. Satyridae				
31	<i>Rohana parisatis parisatia</i>	Black Prince	500-1200	1, 4
IV. Nymphalidae				
32	<i>Issoria sinha sinha</i>	Vagrant	500-1200	1
33	<i>Cethosia cyane</i>	Leopard lacewing	500-900	1, 3
34	<i>Argyreus hyperbius hyperbius</i>	Indian Fritillary	500-900	1, 4
35	<i>Junoia orithya ocyale</i>	Blue Pansy	500-900	1
36	<i>Junonia iphita iphita</i>	Chocolate Soldier	500-900	1, 4
37	<i>Hypolimnas misippus *</i>	Danaid Eggfly	500-1200	1
38	<i>Stibochiona nicea nicea</i>	Popinjay	500-1200	1
39	<i>Dichorragia nesimachus nesimachus</i>	Constable	500-900	1, 4
40	<i>Cyrestis thyodamas</i>	Common Map	500-1200	1
41	<i>Neptis hylas varmona</i>	Common Sailer	500-900	1, 4
42	<i>Athyma opalina orientalis</i>	Hill Sergeant	500-900	1,
43	<i>Sephisia Chandra</i>	Eastern Courtier	500-900	1
44	<i>Histina nama</i>	Circe	600-900	1
45	<i>Penthema lisarda lisarda</i>	Yellow Kaiser	600-1200	1
46	<i>Cynthia cardui</i>	Painted Lady	600-1200	1, 2, 3, 4
V. Erycinidae				
47	<i>Libythea myrrha myrrha</i>	Club Beak	600-1200	1, 4

VI. Lycaenidae				
48	<i>Spindasis lobita himalayanus</i>	Long Banded Silverline	600-1200	1
49	<i>Spindasis rukmini</i> *	Khaki Silverline	600-1200	1
50	<i>Hypolycaena othona</i>	Orchit Tit	500-1200	1
51	<i>Zeltus amasa</i>	Flussy Tit	500-1200	1
52	<i>Heliophorus bramah</i>	Golden Sapphire	600-1200	1
53	<i>Taraka hamada mendesia</i>	Forest Pierrot	600-1200	1
54	<i>Tarucus venosus dharata</i> *	Assam Pierrot	500-900	1

- Note:
- i. * - New addition to the state
 - ii. Reference column:
 1. Marked-1 for collected species of present authors.
 2. Marked-2 for records from Singh *et al* (1999).
 3. Marked-3 for record from Choudhury Bordoloi and Borah (2003)
 4. Marked-4 for record from Borang *et el* (2008)