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Species diversity of Butterflies in South-Eastern part of Namdapha Tiger Reserve, Arunachal Pradesh, India

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ABSTRACT

A detailed study on the butterfly species diversity was carried out at Namdapha Tiger Reserve, in Changlong district, Arunachal Pradesh, during 2008-2009. A total of 1415 individuals' butterflies belonging to 113 species covering, 5 families and 73 genera of order Lepidoptera were recorded during the study period and also 15 rare species were recorded in present study. The family Nymphalidae, represented by (48 species) was the most dominant followed by Papilionidae (24 species), Lycaenidae (17 species) Pieridae (16 species) and Hesperiidae (8 species). From the conservation point of view, the study area is remained rich in flora and fauna species. The most represent families were Nymphalidae and the majority of the species collected were from the family of, Nymphalidae Papilionidae and Lycaenidae. Nymphalidae, Papilionidae, Lycaenidae, Pieridae and Hesperiidae, represents (42.5%, 21.2%, 15.1%, 14.1% and 7.1%) respectively species sampled in all transects. Overall the family composition Nymphalidae represent 393 (48) individuals followed by Papilionidae 339 (24), Lycanidae 320 (17), Peiridae 302 (16) and Hespiiridae 61(8) were recorded during the study periods.

Key words: Butterfly, Species, Diversity, South-Eastern, Namdapaha Tiger Reserve Arunachal Pradesh

INTRODUCTION

Butterflies belong to the order 'Lepidoptera' (scaly winged insect) which evolved 35 million years ago are regarded as one of the important components of biodiversity (New, 1991) and are the second largest order among insect, made up of approximately 1, 50,000 species so far known to the literature. These include moths (Heterocera) and butterflies (Rhopalocera), of which 17,820 are butterflies according to more recent estimate (Shields, 1989) although several estimate have been made from time to time, ranging from a low of 13,000 (Owen,1971) to a maximum of 20,000 (Vane-Wright, 1978), earlier.

Butterflies are also widely recognized as potentially valuable ecological indicators (Gilbert 1984; Erhardt, 1985; Brown, 1991; Kremen, 1992). They are highly sensitive to change in temperature, humidity, and light levels that are typically affected by habitat disturbance (Janzen and Schoener, 1968; Ehrlich *et al.,* 1972; Blau, 1980; Murphy *et al.,* 1990; Speitzer *et al.,* 1997; Bruzel and Elligsen, 1999; Balmer and Erhardt, 2000). Therefore, they have been identified as good indicators of environmental variation and quality (Gilbert 1984; Pyle, 1980; Brown, 1982 and Kremen, 1992) as they are sensitive to and directly affected by any alternation in their habitats, atmosphere, local weather and climate (Watt *et al.,* 1968; Ehrlich *et al.,*1972; Heath, 1981; Rosenberg *et al.,*1986; Wiess *et al.,*1987; Dennis, 1993). In addition, butterfly diversity may serve as a surrogate for plant diversity because butterflies are directly dependent on plants, often in highly co-evolved situations (Ehrlich and Raven, 1964). Butterflies are primary consumers in forest ecosystem (Rosenberg *et al.,* 1986) and more butterflies usually implies more vascular plant species on which female butterflies can lay eggs and use them as nectar sources.

The current rate of species extinction and habitat destruction is increasing alarmingly. Since the last decades, many of them are logged, cleared or converted into plantation (Groombridge, 1992; Padoch and Peluso, 1996; John, 1997; Laurance and Bierregaard, 1997).
As far as their biology has been extensively investigated, butterflies are among the best-known insect groups. Many authors have considered butterflies as being the best group of insects for examining the patterns and the distribution of terrestrial biotic diversity (Robbins and Pler, 1997).

Besides this aspect, butterflies can also be used as biological indicators in rural landscapes (Balletto, 1983; Dover, 1992; Groppali, 1995; Dover *et al*., 1999; Croxton *et al*., 2004; Fabbrie Scaravelli, 2002).There is an increasing body of evidence suggesting that connectivity and quality of habitats in agricultural and scopes have a significant effect on survival of animal species, including arthropods (Andow, 1991; Altieri, 1999; Landis *et al*., 2000; Rossing *et al*., 2003).

Study area

The Eastern Himalaya and the hills of NE India are recognized as a global biodiversity hotspot (Champian and Seth, 1968). While NE India occupies 8% of the country's area, it harbors 56% of its faunal diversity. Within this region, arguably the most biodiversity- rich state (the largest among the seven in North-east India,

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covering 83,743 km^2) is the state of Arunachal Pradesh (26°28' to 29°30'N and 91°30' to 97°30'E). The study was conducted within the 1985 km^2 Namdapha National Park (27°23' to 27°39'N and 96°15' to 96°58'E; Figure 1) in Arunachal Pradesh, India. The site harbours some of the northernmost tropical rainforests in the world (Proctor *et al.*, 1998) and extensive dipterocarp forests. The elevation ranges from 900m to 4571m height with increasing elevation, there is a transition in habitat to subtropical broad-leaved forests, subtropical pine forests, temperate broad-leaved forests, alpine meadows and perennial snow. Though primary forests covered most of the park area, there are extensive bamboo and secondary forests. The park lies within the Indo-Myanmar global biodiversity hotspot (Myers *et al.*, 2000) at the junction of the Palaearctic and Malayan biogeographic realms resulting in a highly diverse species assemblage. Arunachal is considered among the least developed and most remote is being lying in the Eastern Himalayan region.

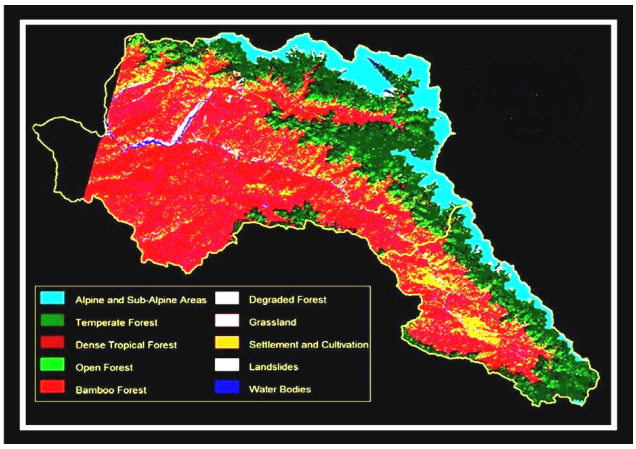

Figure 1. Map of Namdapha Tiger Reserve.

METHODOLOGY

The study was carried out in 2008 and 2009, by sampling butterflies in ten different transect within different landscape. Sampling of butterflies was carried by taking species wise individual count of butterflies by direct sampling in fixed transect routes (line transect) following the 'Pollard walk' methodology proposed by (Pollard *et al.,* 1975; Pollard, 1977; Pollard and Yates, 1993) and adopted by various authors (Blair and Launer, 1997; Sreekumar and Balakrishnan, 2001a; Kunte *et al.,* 1999; Walpole and Sheldon, 1999; Arun, 2003).

Sampling of butterflies in tropical rain forests was done visually on these transects by count method: walking and counting the total number of individuals of each butterfly species on a line transect of 150m for spending 30 minutes in a stretch during sunshine in each route. In all 10 line transects were covered at each site totaling to 3 consecutive days. All the three strata (canopy, middle story and ground level) were sampled for butterflies with the help of binoculars, butterfly nets, a camera and two assistants. Voucher specimens of only those species were collected for identification that could not be identified in the field and identified the species in the field following the (Kehimker, 2009; Heeribal, 2001). Destructive sampling was kept to the minimum. Each site was thus sampled thrice in each month for the two consecutive years 2008-2009. The time duration of each sampling was 30 minutes. In the present study, the "catch and release" method was used: the collected adults were identified in field and released at the end of the sampling. Samplings were carried out in sunny conditions at fixed time, walking on a fixed trajectory and scanning both sides of transect.

Statistical analysis

A. Shannon index - H': Species diversity was calculated using the Shannon Index, which combines the number of species within a site with the relative abundance of each species (Shannon, 1948; Magurran, 1988; Odum, 1997; Krebs, 1989).

$$H' = - \Sigma \, pi \ln pi$$

Here, pi is the proportion of the species in the total sample. The number of species (species richness) in the community and their evenness in abundance (or equitability) are the two parameters that define H'

B. Pielou's evenness index (equitability) or J': The species evenness is the relative abundance or proportion of individuals among the species. Evenness of species reveals how their relative abundance is distributed in a particular sample or site (Pielou, 1969; Magurran, 1988).

$$J' = H'/ \ln S$$

Here, S is the number of species present in the site. The value of J' ranges from 0 to 1.The less variation in communities between the species, the higher the value of J'. The butterfly species diversity was compared among sites with the Shannon and Evenness indices (Magurran, 1988). The species counts were then categorized in to four groups (e.g. Rare, Uncommon, Common and not rare) based on their availability or frequency of sighting. The successful identification of butterflies was done using the following literature: (Marshall and de Niceville, 1882; Moore, 1890,1905; Swinehore, 1905,1913; Evans, 1932; Talbot, 1930,1947;Wynter-Blyth, 1975; D' Abrera, 1982, 1985; 1986), Smith, 1989; Haribal, 1992; Kunte, 2000; Kehimker, 2008. The classification followed here is based on Ackery (1984).

RESULT AND DISCUSSION

During the study periods from August 2008 to December 2009, a total of 1415 individual butterflies were recorded in 10 different transect (Table 1). One hundred and thirteen species belonging to five families and including seventy one genera of butterflies were recorded during the study period. *Pieris canidia* (Linn.) was the most dominant species of Butterfly in terms of number of individuals (103) followed by *Delias belladona* (Fabr.) (100), *Spindasis lohit* (Hors.) (98), *Tirumala septentrionis* (Butler) (95), *Euploea Sylvester* (Fabr.) (94), *Euploea muliciber* (Cramer) (91), *Polyura anthamas* (Drury) (89), *Euploea radamanthus* (Fabr.) (86). is listed under Indian Wildlife (Protection) Act, 1972. The maximum number of species sampled, belong to family i.e. Nymphalidae (n=48) followed by Papilionidae (n=24), Lycaenidae (n=17), Pieridae (n=16), Hesperiidae (n=8) were recorded along the ten different sampling area from August 2008 to December 2009 (Table 2). Survey works were restricted only in

Table 1. Butterflies species sampled and relative abundances in the sampled sites; numbers represent the sum of the individuals collected as a sum of 2009 seasons

Species	Transect										Total no
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
Nymphalidae	155	43	32	21	17	15	24	36	27	23	393
Papilionidae	146	18	20	85	10	11	13	12	15	9	339
Peiridae	172	26	13	15	13	13	3	25	12	10	302
Lycanidae	127	23	24	14	26	33	35	11	14	13	320
Hespiiridea	4	12	5	11	2	6	5	8	5	3	61
Total	604	122	94	146	68	78	80	92	73	58	1415

Table 2. Percentage of butterfly's families sampled in South-Eastern part of Namdapha Tiger Reserve. (n=111).

Family Names	Species number	Percentage of species	WPA-protected species		
			Schedule I	Schedule II	Schedule IV
Nymphalidae	48	42.5%	2	12	1
Papilionidae	24	21.2%	-	-	1
Lycaenidae	17	15.1%	1	2	3
Pieridae	16	14.1%	-	-	1
Hesperiidae	8	7.1%	-	1	1
Total	113	100%	3	15	7

South-Eastern part of Namdapha Tiger Reserve. The most represent dominant families were Nymphalidae as well as the majority of the species collected from the family of, Nymphalidae Papilionidae and Lycaenidae. The family Nymphalidae, Papilionidae, Lycaenidae, Pieridae and Hesperiidae represents (42.5%, 21.2%, 15.1%, 14.1% and 7.1%) species respectively which was sampled 10 different transects (Table 2). Where the family Nymphalidae has been contributed maximum 43% of species composition, followed by Hesperiidae contribute less than 10%. Most of the species collected however showed a very low frequency of butterflies' sightings. Nevertheless several rare species were collected during the observation based on their occurrence and distribution in locality. Most of the family was well represented except Pieridae and Hesperiidae.

The occurrence of butterflies was seen to abundant from September to January. In conclusion butterflies in our environmental conditions seem to be poorly effective as landscape bio indicators (or large-scale indicators), for their biological and ecological characteristics, including the high mobility of adults and the strong dependence from the microhabitat. Plant typology of the micro-habitat greatly influenced the richness of butterflies and showed to be very important for their conservation, including rare species. The value of the ecological compensation areas (including green lanes and weed margins) is especially important as they may be the only semi-natural habitats left in many rural areas. The architecture of the hedgerow (or in general of linear features) could be an important factor for the numeral species. Management of ecological compensation areas is crucial for Lepidoptera conservation, including conservation of rare species.

Some interventions for the protection of Lepidoptera fauna can be suggested, including improving of the floral diversity surrounding field, the promotion of low impact cutting of ecological compensation areas mainly during the flowering of the weeds and avoiding, when possible, chemical control of weeds at field borders (Fabbri and Scaravelli, 2002).

We also calculated different diversity index i.e. Shannon diversity, Simpson_1-D Evenness_e^H/S, Equitability_J, Dominance_D indices as a measure of diversity within the transects since these indices incorporate both species richness and abundance into a single value (Table 3). The Shannon's diversity index showed the same pattern with minor variations. The Simpson and Shannon J (evenness) indices revealed that in scrub jungle the individuals among species were not evenly distributed during the survey period indicating that some species were more abundant than the others. This reflects on the difference in the efficiency of different butterfly species to efficiently use the habitat. The abundance of individuals of a species at any given point on a temporal scale is again dependent on various biotic and abiotic environmental factors.

General species composition

Overall the family composition, Abundance and species richness of butterflies were recorded. i.e. Nymphalidae represent 393 (48) individuals followed by Papilionidae 339 (24), Lycanidae 320 (17), Peiridae 302 (16) and Hespiiridae 61(8) were recorded during the study periods (Figure 2).

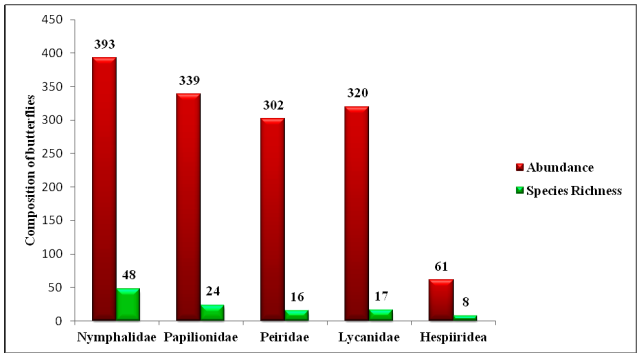

Figure 2. Species composition of butterflies in South-Eastern part of Namdapha Tiger Reserve.

Table 3. Different diversity index of butterflies in South-Eastern part of Namdapha Tiger Reserve.

Species Diversity	Value
Shannon_H	4.338
Simpson_1-D	0.985
Evenness_e^H/S	0.8046
Equitability_J	0.9539
Dominance_D	0.015

Present record of total 113 under schedule act showing that the area is rich in species in Southern part of Namdapaha tiger reserve indicates that the diversity of butterfly diversity and there is an urgent need to adapt butterfly species in this area has been increased to conservation policies. The reason for increase in diversity might conservations are, development of butterfly park, be due to the favourable tropical climate conditions, cultivation and protection of larval and nectar host plants availability

Table 4. Microhabitat and habitat types of butterfly's sampled plot in South-Eastern part of Namdapha Tiger Reserve.

Transect no/ Time	Canopy cover	Ground cover	Habitat type	Habitat disturbance	Human activity	Aspect	Slope	Elevation	Topography	Soil
1 (6:30-9:10)	95	92	Mixed forest	1	1	East	20	377 m	Hill	Rocky
2 (7:10-9:15)	98	95	Mixed forest	0	1	West	35	486	Hill	Rocky
3 (7:15-9:05)	98	95	Mixed forest	0	0	East	40	716	Hill	Rocky
4 (7:00-9:10)	92	90	Mixed forest	0	0	East	60	1197	Hill	Rocky
5 (7:15-9:20)	98	95	Mixed forest	1	1	South	50	1172	Hill	Rocky
6 (7:10-9:30)	97	94	Dray mixed forest	0	0	South	35	1384	Hill	Sandy
7 (7:10-9:00)	96	98	Tropical ever-green forest	0	2	West	20	1107	Hill	Rocky
8 (7:00-9:10)	98	97	-do-	1	2	South	25	1093	Valley	Boulders
9 (6:45-9:15)	95	92	Semi ever green forest	0	1	North	15	1201	Valley	Boulders
10(6:55-9:00)	98	93	Tropical forest	0	1	North	19	1205	Valley	Rocky

Comparison of different microhabitats

Among all the sites, hill and undulating areas are the most interesting habitats, which observed many rare and endemic species. The wet seepage areas at the hilly are also an excellent place where many Pieridae and Papilionidae were found to be congregating in moderate number. The regenerating forest between Kherbari and Musala was not explored thoroughly; it was generally poor in species, though not necessarily in numbers of individuals (Table 4). Looking at the semi ever-green forest, most of the species found were characteristic of canopy with many species that are usually rare and only occasionally found at the lower level.

In conclusion butterflies in our environmental conditions seems to be very poorly effective as landscape bioindicators (or large-scale indicators), for their biological and ecological characteristics, including the high mobility of adults and the strong dependence from the microhabitat. Plant typology of the micro-habitat has been greatly influenced their richness of butterflies and showed to be very important for their conservation, including rare species. The value of the ecological compensation areas is especially important as they may be the only tropical ever green forest habitats left in many degraded patch areas. Management of ecological compensation areas is crucial for Lepidoptera conservation, including conservation of rare species.

of more number of larval host plants and specifically used by these butterflies and provide vegetation cover of herbs, shrubs and trees for nectaring protection and maintenance.

Our data showed the micro-habitat within a site, including vegetation diversity, significantly affects the Lepidoptera richness. Also cardinal orientation of the transept, affecting the isolation intensity, could affect the Lepidoptera diversity and frequency catches but this conclusion is only preliminary.

Some interventions for the protection of Lepidoptera fauna can be suggested, including improving and promotion of low impact cutting of ecological compensation areas mainly during the flowering of the weeds and avoiding, when possible, chemical control of weeds at field borders (Fabbri and Scaravelli, 2002).

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Appendix 1. Checklist of Butterfly and their status and distribution in South-Eastern part of Namdapha Tiger Reserve

Name of family	**Hesperiidae**		
Common name	**Scientific name**	**Status**	**Distribution**
Branded orange awlet	*Bibasis oedipodae*	UC	HP,UT,AP,NE
Orange-tail awl	*Bibasis sena*	C	WG,AP,WB,UT
White-banded awl	*Hasora temintus*	C	WG,SK,AP,NE,A&N
Plain banded awl	*Hasora vitta*	UC	WG,SK,AP,NE,A
Dark yellow-banded flat	*Celaenorrahinus aurivittata*	C	AS,AP,
Tricoloured pied flat	*Coladenia indrani*	C	WB,SI,HP,AP,NE
Spotted angle	*Caprona agama*	R	UT,MR,AP,NE
Great swift	*Pelopidas assamensis*	UC	MR,MP,HP,AP
Name of family	**Papilionidae**		
Common name	**Scientific name**	**RA**	**Distribution**
Bhutan glory	*Bhutanitis lidderdalei*	R	SK,AP,MNP,NL
White drangotail	*Lamproptera curius*	NR	AS,AP,
Green drangotail	*Lamproptera meges*	UC	AS,AP,NL
Glossy blue bottle	*Graphium cloanthus*	NR	J&K,AP,
Common blue bottle	*Graphium sarpedon*	C	J&K,AP,NE,SI
Great jay	*Graphium eurypylus*	NR	SK,AP,NE,A
Common jay	*Graphium doson*	C	SI,MR,O,WB,UT,AP,NE
Tailed jay	*Graphium agamemnon*	C	GJ,UT,AP,NE,A&N
Fivebar swordtail	*Graphium antiphates*	C	SK,AP,WG,GOA
Spot swordtail	*Graphium nomius*	C	GJ,MP,CH,UP,UT,AP
Fourbar swordtail	*Graphium agetes*	NR	SK,APS
Lesser mime	*Chilasa epycides*	R	SK,AP
Common mime	*Chilasa mime*	NR	HP,AP,SI,NE
Common mormon	*Papilio polytes*	C	TOI(INDIA)
Red Helen	*Papilio helenus*	C	SI,UT,AP
Great mormon	*Papilio memnon*	LC	WB,SK,AP,A&N
Redbreast	*Papilio alcmenor*	NR	HP,AP,NE
Common yellow swallowtail	*Papilio machaur*	NR	J&K,AP
Paris peacock	*Papilio paris*	NR	SI,MR,ANP,O,CH,UT,SK
Common peacock	*Papilio polyctor*	C	J&K,AP
Common batwing	*Atrophaneura varuna*	NR	UT,AP
Common rose	*Atrophaneura aristolochiae*	C	TOI(INDIA)
Common bird wing	*Triodes helena*	NR	O,SK,AP,A&N
Name of family	**Pieridae**		
Common name	**Scientific name**	**RA**	**Distribution**
Chocolate gram yellow	*Eurema sari*	R	SK,AP
Tree yellow	*Gandaca harina*	NR	SK,AP
Tailed sulphur	*Dercas verhuelli*	NR	SK,NB,AP

Yellow orange tip	*Ixias pyrene*	C	TOI(INDIA)
Great orange tip	*Hebomoia glaucippe*	C	PI,SK,AP,NE,A
Pale wanderer	*Pareronia avatar*	R	SK,AP,NE
Spot puffin	*Appis lalge*	NR	UT,AP,WG,GOA
Green-veined white	*Pieris napi*	NR	J&K,AP
Indian cabbage white	*Pieris canida*	C	TOI(INDIA)
Spotted sawtooth	*Prioneris thestylis*	NR	UT,AP
Great black vain	*Aporia agathon*	UC	K,AP
Hill jezebel	*Delias belladona*	C	HP,AP
Pale jezebel	*Delias sanaca*	NR	J&K,AP
Red-base jezebel	*Delias pasithoe*	NR	SK,AP,HILLS OF NE
Red-spot jezebel	*Delias descombesi*	NR	SK,AP
Painted jezebel	*Delias lyparete*	UC	UT,AP,NE,WB,O,AP,APP
Name of family	**Lycaenidae**		
Common name	**Scientific name**	**RA**	**Distribution**
Common gem	*Poritia hewitsoni*	UC	UT,AP
Common brownie	*Miletus chinensis*	NR	SK,AP
Forest pierrot	*Taraka hamda*	NR	SK,AP
Large oak blue	*Arhopala amantes*	C	UT,AP,WB,SB,GJ,MP
Aberrant oak blue	*Arhopala absous*	NR	SK,AP
Sliver streak blue	*Iraota timoleon*	UC	PI,GJ,UP,WB,AP,UT,NE
Yam fly	*Loxura atymnus*	C	UT,AP,WB,PI,MP
Common imperial	*Cherita freja*	C	UT,AP,WG,
Spotted royal	*Tajuria maculatta*	NR	SK,DJ,AP,NE
Fluffy tit	*Zeltus amasa*	UC	WG,SK,AP,NE
Large guava blue	*Dendorix perse*	NR	SI,HP,AP,O
Plane	*Bindahara phocides*	NR	WG,SK,AP
Long-banded silverline	*Spindasis lohit*	C	UT,AP,WB,PI,MP
Golden sapphire	*Heliophorus brahma*	NR	UT,AP,WB,
Plum judy	*Abisaran echerius*	C	PI,HP,AP,NE,GJ,WB
Striped punch	*Dodona adonira*	C	SK,AP,NE
Mixed punch	*Dodona ouida*	NR	UT,AP,NE
Name of family	**Nymphalidae**		
Common name	**Scientific name**	**RA**	**Distribution**
Dark blue tiger	*Tirumala septentrionis*	C	PI,MH,O,HP,AP
Double-branded crow	*Euploea sylvester*	C	SI,MH,SK,AP,NE
Striped blue crow	*Euploea muliciber*	C	HP,AP,NE,SI
Blue-spotted crow	*Euploea midamus*	C	HP,AP,
Magpie crow	*Euploea radamanthus*	C	SK,AP,NE
Common nawab	*Polyura anthamas*	C	PI,UT,AP,NE,AM
Stately nawab	*Polyura dolona*	R	HP,AP,NE

Great nawab	*Polyura eudamippus*	C	UT,AP
Red caliph	*Enispe euthymius*	NR	SK,AP,NE
Jungle glory	*Thaumantis diores*	UC	SK,AP,NE
Manipur glory	*Sticopthalma sparta*	R	M,NL,AP
Great evening brown	*Melanitis zitenius*	R	WG, UT,AP,NE
Bamboo tree brown	*Lethe europa*	C	SI,MP,JK,O,WB,UT,AP,NE
Common tree brown	*Lethe rohria*	C	SI,MP,JK,J&K,AP,NE
Banded tree brown	*Lethe confuse*	C	J&K,AP,NE
Straight-banded tree brown	*Lethe verma*	C	J&K,AP,NE
Dusky diadem	*Ethope himachala*	R	SK,AP
White bar bush brown	*Mycalesis anaxias*	UC	SI,SK,AP
Dark-branded bush brown	*Mycalesis mineus*	C	MP,WB,HP,AP,NE
Common five ring	*Yathima baldus*	C	PI,GJ,MP,HP,AP
Red lacewing	*Cethosia bibles*	C	SK,AP,NE,A&N
Leopard lacewing	*Cethosia cyane*	UC	UT,AP,NE,BH,WB,O,EG
Large silver stripe	*Childrena childreni*	C	J&K,AP,NE
Indian fritillary	*Argyreus hyperbius*	C	J&K,AP,NE,RJ
Cruiser	*Vindula erota*	NR	WG,SK,AP,NE,A
Large yeoman	*Cirrochroa aoris*	C	SK,AP,NE
Common yeoman	*Cirrochroa tyche*	C	SK,AP,NE,WB,A
Common leopard	*Phalanta phalantha*	C	TOI
Green commodore	*Sumalia daraxa*	NR	UT,AP,NE,WB
Commander	*Moduza procries*	C	PI,MP,UT,WB,NE,A
White commodore	*Parasarpa dudu*	R	SK,AP,NE
Common sergeant	*Athyma perius*	C	HP,AP,NE,PI,MP
Studded sergeant	*Athyma asura*	R	HP,AP,NE
Small yellow sailer	*Neptis miah*	NR	SK,AP,NE
Common sailer	*Neptis hylas*	C	TOI
Yellow sailer	*Neptis ananta*	R	HP,AP,NE
White-edged blue baron	*Euthalia phemius*	NR	SK,AP,NE,WB
Gaudy baron	*Euthalia lubentina*	C	PI,WB,HP,AP,NE
Blue duchess	*Euthalia duda*	R	SK,AP,NE
Panther	*Neurosigma siva*	R	SK,AP,NE
Common map	*Cyrestis thyodamas*	UC	J&K,AP,NE,SI
Common maplet	*Chersonesia risa*	UC	UT,AP,NE
Tabby	*Pseudergolis wedah*	C	HP,UT,SK,AP,NE
Painted courtesan	*Euripue consimilis*	R	SI,WG,EG,UT,AP,NE
Circe	*Hestina nama*	NR	HP,AP,NE
Indian red admiral	*Venesa indica*	C	SI,J&K,AP,NE
Wizard	*Rhinopalpa polynice*	UC	AS,AP,NL,MN
Orange oak leaf	*Kallima inachus*	NR	J&K,AP,NE,WB
Indian white admiral	*Limenitis trivena*	R	SI,WG,EG,UT,AP,NE

NR- Not Rare ; **R**- Rare; **C**- Common ; **UC**- Uncommon

NOTE- Distribution in India : HP- Himanchal Pradesh, UT- Uttaranchal, AP- Arunachal Pradesh, NE- North East, WG-Western Ghat, WB- West Bengal, A&N- Andaman & Nicobar, SK-Sikkim, APP-Andhra Pradesh, AS-Assam, SI- South India, MR/MH-Maharashtra, MP- Madhya Pradesh, MNP- Manipur, NL- Nagaland, J&K- Jammu & Kashmir, O-Orissa, GJ- Gujarat, CH- Chhattisgarh, UP- Uttar Pradesh, TOI- Throughout India, PI- Peninsular India, GOA, DJ-Darjeeling, RJ- Rajasthan.