

Butterfly (Lepidoptera: Insecta) Diversity of Amchang Wildlife Sanctuary



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Abstract

Lepidoptera is the second largest order in the class insect that include moths and butterflies. Butterflies are important bio-indicators which should be protected to conserve the bio-diversity and environment. Different plant species and habitat of Amchang wildlife sanctuary attracts a wide variety of butterfly fauna which play a vital role in pollination of various flowering plants besides a key component of food chain. A regular survey was conducted from March 2014 to October 2015 by visual observation. Butterflies were sampled from four habitat i.e. Disturbed habitat, Moderately disturbed habitat, less disturbed habitat and undisturbed habitat using transect method of 1x1 Sq. Km were recorded at least thrice in each season. During the study 72 species belonging to five major families were recorded of which Nymphalidae was the most common, which was followed by Pieridae, Papilionidae, Satyridae and Danidae.

Evens (1932) reported 962 butterfly species belonging to 6 families from North Eastern States except Sikkim Himalayas. Out of these 303 butterfly species were recorded from Manas biosphere reserve in 2009 in Assam. Different plant species having commercial and aesthetic values have been studied by Kakoti (2002). Nowadays, due to excessive forest cutting for timber, fuel wood and forest products, the area under forest are shrinking and its capacity to satisfy the need of butterfly is simultaneously diminishing (Kakoti; 2002). Many workers have done various works on insects and butterflies in Assam and North-East India, but a little work has done for study of Lepidopteran population in different reserve forest and Wildlife sanctuary.

Sharma et al., (2010) has carried out a research on diversity and distribution of mammals in Amchang Wild life Sanctuary. However no research has been done on the insects as well as butterfly diversity of Amchang Wild life Sanctuary. Therefore, the present study has been aimed to investigate the Lepidoptera (Butterfly) population of selected forest pockets in Amchang Wildlife Sanctuary.

Keywords: Butterfly, Diversity, Amchang Wildlife Sanctuary.

Introduction

Butterflies (Lepidoptera) are the most tantalizing beautiful creatures and one of the most plant dependent groups of insects compared to the other groups of insect. Butterflies are beneficial as they serve as pollinators and indicators of environmental quality and are appreciated for their aesthetic value (Chakravarthy et al., 1997). They are also good indicator in terms of anthropogenic disturbance and habitat quality as they are sensitive to changes in the environment (Sparrow et al.1994; Haribal, 1998 and Kocher et al., 2000).

Nearly 1500 butterflies (Smetacek 1992, Gay 1992) are identified from the Indian Sub continent, constituting 8.33% of the 18,000- 20,000 known species of butterflies of the World, most of the Indian butterflies are reported from the Himalayas and from the Western Ghats (Larsen 1987a; 1988). Likewise Nepal has recorded 640 species and the adjoining state of Sikkim has recorded 689 and very little is known about butterfly diversity in Bhutan despite being estimated to have 800-900 species of butterflies.

North Eastern India, harbouring some of the World's richest biodiversity is home of more than 500 species of butterflies. Evans (1932) reported 962 species of butterflies belonging to six families from North Eastern States except Sikkim Himalayas. Out of these, 303 species of butterflies were recorded by Choudhury (2009) in Manas Biosphere Reserve in between August 2006 to July 2009.

In North East India butterflies are well studied by de Niceville (1886, 1890), Moore (1890-1903), Marshall and de Niceville (1882), Bingham (1905, 1907), Evans(1932), Talbot (1939, 1947), Wynter-Blyth

(1957) and presently a little work has been worked out by Kakati et al., (2002) Baruah et al., (2004) and Choudhury et al., (2009).

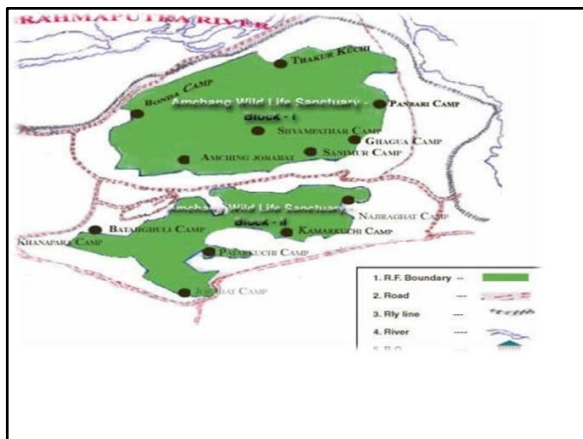
Though a little works has been done for the study of Lepidopteron population in different reserve forest and wild life sanctuary of Assam, there is no any record of study done on butterfly diversity in Amchang wildlife sanctuary. Therefore in the present study it has been aimed to investigate the butterfly population and the vegetation pattern in the study area Amchang wildlife sanctuary of Assam.

Aim and Objective of the Work

1. To find out the species diversity of butterfly by conducting an extensive survey in the selected area of Bonda Range in Amchang wildlife sanctuary.
2. To study the vegetation pattern in the study area.

Study Area

Amchang wildlife sanctuary, lies between Longitude 91° 50'E to 91° 58'E and Latitude 26°06' N to 26° 13'N. Its elevation varies from 50-569 meter ASL. It is bounded by River Brahmaputra in the North, National Highway and Sonapur in the South. In the West side Guwahati city and in Eastern side Digaru Railway station. The area of the sanctuary is about 78.64sq.km.which comprises Amchang Reserve forest (53.18sq.km.), Khanapara Reserve forest (09.96sq.km.) and South Amchang Reserve forest (15.50sq.km.) is an important area of the conservation of isolated small population of *Elephas maximus*.



Longitude 91° 50'E to 91° 58'E
Latitude 26°06' N to 26° 13'N.
Elevation varies from 50-569meter ASL.

North :-bounded by River Brahmaputra.
South :- National Highway (37).
West :-Guwahati city
East :- Digaru Railway station.

Map of Amchang wild life Sanctuary

The atmospheric temperature of the study area was recorded as 31.76 ± 2°C in the month of July which was come down to 3± 2°C in the month of January. The precipitation in the study area was recorded as 42.2 mm where as the mean annual rainfall was recorded 1600.00 mm during the period of study. The maximum average rainfall was recorded as 343.11mm in the month of July where as the minimum average rainfall was recorded as 9.4 mm in the month of December. The maximum relative humidity in the month of July was recorded as 85.6% and minimum in the month of January was recorded as 68.2% during the study period. (Data collected from meteorological station, Lokpriya Gopinath Bordoloi International Airport) .The main vegetation types are: -

1. Semi-evergreen and mixed deciduous forest.
2. Tropical and sub tropical deciduous and evergreen forest.
3. Secondary Moist Bamboo Brakes.
4. Open Grass lands (Das, 1973). The major sources of water in Amchang wildlife sanctuary is river Brahmaputra and its tributary Digaru.

Methodology

Methodology has been followed by two methods that is Primary data collection and Secondary data collection.

- (i) For Primary data collection, the survey was carried out in the parts of Bonda-Birkuchi, Panikhaty - Hatisila, Hajongbari - Tatimara, Thakurkuchi - Panbari, Ghagua-Amchang Jorabat of Amchang Wildlife Sanctuary.
 - (ii) For recording butterflies "Pollard Walk" method was adopted with a few modifications based mainly on Geographical and Climate consideration 1x1 meter transect were laid in each habitat types such as-crop field, Shrub land, close canopy along the roads and wetlands/streambeds.(Pollard and Yates,1993).
- B. For secondary data collection, different Books, Journals, Papers and Website was followed to identifying the butterfly species.

Result

The survey was carried out in the parts of Bonda, Birkuchi, Panikhaity, Hatisila, Hajongbari, Tatimara, Chandrapur, Thakurkuchi, Panbari, Ghagua and Amchang Jorabat area of Amchang Wildlife sanctuary. During the study, the butterflies were recorded by walking on fixed transects (Pollard and Yates, 1993) in different habitats. The butterflies were encountered in different transects of 1 KM and were recorded at least thrice in each season. Some random transects also had been made in different habitat. On the basis of Visual observation during the entire study period the status of various butterflies of the area was prepared.

Collection of specimens was avoided and unidentified specimens were collected with the help of Aerial netting and released after taking a photograph because of the conservation policy. Species which encountered a total abundance exceeding 30%,individuals were described as very common,10-30% common in sighting , 5-10% not rare ,1-5% rare and less than1% as very rare. The study was conducted from 2014-2015 covering four different seasons:

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Summer (June-August), Autumn (September-November), Winter (December-February), Spring (March-May). All surveys and sampling were limited to sunny days, under calm to light, wind conditions when mean atmospheric temperature was about 32°C and average humidity was about 80%. The following hours of the day were selected for field survey and collection of butterflies. 9.00 – 10.00Hrs, 10.30 – 11.30 Hrs, 12.00 – 13.00 Hrs, 13.30 – 14.30Hrs, 15.00 – 16.00Hrs and 16.30 – 17.30 Hrs. Sampling began in June 2014, when the plants were beginning to flower, and was carried out survey 13-15 days of a month until the end of sept.2015. The butterflies were identified by observing their morphology as well as their particular behaviour. Identification of butterfly had been carried out with the help of following books and website Haribal (1992) and cross checked with Evens (1932), Mani (1986), Bingham (1905), Kehimkar (2008), Winter –Blyth (1957), Kunte (2000), Talbot (1978) and Varshney (1994).

List of Vegetation of Amchang Wild Life Sancturay

Common Name	Scientific Name
Mango	<i>Mangifera indica</i> ,Linn.
Coconut	<i>Cocos nucifera</i> ,Linn.
Drum Stick	<i>Moringa oleifera</i> ,Lamk.
Indian Goose Berry	<i>Emblicaofficinalis</i> ,
Indian Rubber	<i>Ficus elastica</i> var, <i>decora</i> Roxb.
Segun	<i>Tectona grandis</i> ,Linn f.
Satiana	<i>Alstonia scholaris</i> (Linn)R.Br.
Bogori	<i>Zyzyphus jujuba</i> ,Lamk.
Silikha	<i>Terminalia chebula</i> ,Retz.
Giant Banana	<i>Muse gigantea</i> ,Duthie

Wood apple	<i>Aegle marmelos</i> ,corr
Bulld wood	<i>Mimusops clengi</i> , Linn.
Tamarind tree	<i>Tamarindus indica</i>
Tea	<i>Thea sinensis</i> var <i>assanica</i>
Purging cassia	<i>Cassia fistula</i> ,L.
Pomelo	<i>Citrus decumane</i> , Linn.
Sweet Orange	<i>Citrus sinensis</i> , osbeck
Indian Coral tree	<i>Erythrina indica</i> , Linn.
Beetle Palm	<i>Areca catechu</i> , Linn.
Date Palm	<i>Phoenix sylvestris</i> , Roxb.
Carambola	<i>Averrhoa carambola</i> ,Linn.

List of Nectaring Plants of Amchang Wild life Sanctuary

Common Name	Scientific Name
Rose (red)	<i>Rosa damascene</i> , mill L.
Rose (white)	<i>Rosa alba</i> ,L.
Lantana	<i>Lantana camera</i> ,L.
Touch-me-not	<i>Mimosa pudica</i> ,L.
Ixora	<i>Ixora macrophylla</i> ,Linn.
Hibiscus	<i>Hibiscus rosa-sinensis</i> ,L.
Mussaenda	<i>Mussaenda froudosa</i> , Linn.
Yellow oleander	<i>Thevetia peruviana</i> , (Pers Schum)
Pea flower	<i>Clitoria ternatea</i> , L.
Gold mohur flower	<i>Caesalpinia pulcherrima</i> , (L.) Sw
Datura flower	<i>Datura stramonium</i> ,Linn.
Papaya flower	<i>Carica papaya</i> L.
Lemon	<i>Citrus paradisi</i> , Macfad
Magnolia	<i>Magnolia grandiflora</i> ,L.
Jasmine	<i>Jasminum sambac</i> (L.) Aiton
Pomegranate	<i>Punica granatum</i> ,Linn.

List of Butterfly diversity in Amchang Wildlife Sanctuary

Sl.No	Common Name	Scientific Name	Family
1	Common Mormon	<i>Papilio polytes</i>	Papilionidae
2	Common Birdwing	<i>Triodes helena</i>	Papilionidae
3	Great Windmill	<i>Atrophaneura dasarada</i>	Papilionidae
4	Common Rose	<i>Atrophaneura aristolochiae</i>	Papilionidae
5	Common Blue Bottle	<i>Graphium sarpedon</i>	Papilionidae
6	Lime Butterfly	<i>Papilio demoleus</i>	Papilionidae
7	Common Mime	<i>Chilasa clytia</i>	Papilionidae
8	Great Mormon	<i>Papilio memnon</i>	Papilionidae
9	Common Jay	<i>Graphium agammemnon</i>	Papilionidae
10	Red Helen	<i>Papilio helenus</i>	Papilionidae
11	Fivebar Swordtail	<i>Panthyra antiphates</i>	Papilionidae
12	Lemon Pansy	<i>Precis lemonias</i>	Nymphalidae
13	Great eggfly	<i>Hypolimnas bolina</i>	Nymphalidae
14	Dark Blue Tiger	<i>Tirumala septentrionis</i>	Nymphalidae
15	Grey Pansy	<i>Precis atlites</i>	Nymphalidae
16	Striped Tiger	<i>Danaus genutia</i>	Nymphalidae
17	Peacock Pansy	<i>Junonia almana</i>	Nymphalidae
18	Plain Tiger	<i>Danaus chrysippus</i>	Nymphalidae
19	Leopard Lacewing	<i>Cethosia cyane</i>	Nymphalidae
20	Yellow Pansy	<i>Junonia hierta</i>	Nymphalidae
21	Common Baron	<i>Euthalia aconthea</i>	Nymphalidae
22	Common Lascar	<i>Pantoporia hordonia</i>	Nymphalidae
23	Blue Striped Palmfly	<i>Elymnias patna</i>	Nymphalidae
24	Whitebar Brushbrown	<i>Mycalesis anaxias</i>	Nymphalidae
25	Common Brushbrown	<i>Mycalesis perseus</i>	Nymphalidae
26	Common Fiverring	<i>Ypthima baldus</i>	Nymphalidae
27	Common Jester	<i>Symbrenthia hypselis</i>	Nymphalidae
28	Yellow Rajah	<i>Charaxes marmax</i>	Nymphalidae
29	Tawny Rajah	<i>Charaxes polyxena</i>	Nymphalidae
30	Pallid Nawab	<i>Polyura arja</i>	Nymphalidae

31	Red Lacewing	<i>Cethosia bibles</i>	Nymphalidae
32	Large Yeomen	<i>Cirrochroa aoris</i>	Nymphalidae
33	Common Sergeant	<i>Parathyma perius</i>	Nymphalidae
34	Staff Sergeant	<i>Athyma selenophora</i>	Nymphalidae
35	Blue Tiger	<i>Tirumala limniace</i>	Nymphalidae
36	Common Lascar	<i>Pantoporia hordonia</i>	Nymphalidae
37	Nigger	<i>Orsotrioena medus</i>	Nymphalidae
38	Yellow Coster	<i>Acraea issoria</i>	Nymphalidae
39	Punchinello	<i>Zemeros flegyas</i>	Nymphalidae
40	Orange Oakleaf	<i>Kallima inachus</i>	Nymphalidae
41	Sullied Sailor	<i>Neptis soma</i>	Nymphalidae
42	Common Map	<i>Cyrestis thyodamas</i>	Nymphalidae
43	Mottled Emigrant	<i>Catopsilia pyranthe</i>	Pieridae
44	Common Grass Yellow	<i>Eurema hecabe</i>	Pieridae
45	Common Emigrant	<i>Catopsilia crocale</i>	Pieridae
46	African Emigrant	<i>Catopsilia florella</i>	Pieridae
47	Red based Jezebel	<i>Delias aglaia</i>	Pieridae
48	Painted Jezebel	<i>Delias hyperate indica</i>	Pieridae
49	Broad Boardered Grass yellow	<i>Eurema brigitta</i>	Pieridae
50	Spotless Grass Yellow	<i>Eurema lacta lacta</i>	Pieridae
51	3-Spot Grass Yellow	<i>Eurema blanda silhetana</i>	Pieridae
52	Small White	<i>Pieris canidia</i>	Pieridae
53	Small White	<i>Pieris rapae</i>	Pieridae
54	Large White	<i>Pieris brassica</i>	Pieridae
55	Striped Albatross	<i>Appias libythea olferna</i>	Pieridae
56	Plain Puffin	<i>Appias indra narendra</i>	Pieridae
57	Chocolate Albatross	<i>Appias lycnida</i>	Pieridae
58	Spot Puffin	<i>Appias lalage lalage</i>	Pieridae
59	Albatross	<i>Appias libythea libythea</i>	Pieridae
60	Dark Clouded Yellow	<i>Colias electo fieldi</i>	Pieridae
61	Brown Veined White	<i>Anaphaeis aurora</i>	Pieridae
62	Bath White	<i>Pontia daplidice</i>	Pieridae
63	Lesser Bath White	<i>Pontia chloridice</i>	Pieridae
64	Yellow Orange Tip	<i>Ixias pyrene pirenassa</i>	Pieridae
65	Great Orange Tip	<i>Hebomoia glaucippe</i>	Pieridae
66	Common Gull	<i>Cepora nerissa</i>	Pieridae
67	Tailed Sulphur	<i>Dercas verhuelli</i>	Pieridae
68	Common Palmfly	<i>Elymnias hypermnestra</i>	Satyridae
69	Common Evening Brown	<i>Melanitis leda</i>	Satyridae
70	Banded Tree Brown	<i>Lethe confuse</i>	Satyridae
71	Common Indian Crow	<i>Eupolea core</i>	Danaidae
72	Striped Blue Crow	<i>Eupolea mulciber</i>	Danaidae

Conclusion

Study was carried out only for one year revealed 251 individuals and 72 species of five major families. The stated area had rich butterfly diversity. The development of industrial area within this area having chemical zone can affect to the biodiversity. It is very important to understand in relation between host plant and the butterflies to protect them as they have co-evolved. Further systematic research is essential for getting a detailed periodic estimate and comparisons of the faunal diversity of butterflies in different seasons.

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