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## STUDY OF BUTTERFLY DIVERSITY OF NATURE PARK WETLAND, KOLKATA, INDIA

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### ABSTRACT

Butterflies are considered as model organisms in assessing micro level changes in habitat characteristics. The present study was aimed to reveal the diversity of butterfly species in Nature Park, situated in the outskirts of the urban environments of Kolkata, where thousands of hectares of wetlands along with a wide variety of floral diversity are supporting avian as well as butterfly diversity. Random sampling of butterflies was carried out in the Nature Park for a period of one year with observations during pre-monsoon (March - June), monsoon (July - October) and post-monsoon (November - February) seasons. Eighty two butterfly species were identified in the Nature Park during the study period. Members of the family Nymphalidae were dominating (31.70%), followed by Lycaenidae (25.60%), Hesperidae (17.07%), Pieridae (14.63%) and Papilionidae (10.97%). The diversity of butterflies was higher during early pre-monsoon, followed by late monsoon and early post-monsoon.

Key words: Nature Park wetland, Butterfly diversity, environmental monitoring.

### INTRODUCTION

The importance of insects as service providers in both terrestrial and aquatic ecosystems are well known. According to Losey and Vaughan (2006), insects help in pest control, pollination, nutrient decomposition and also in maintaining species diversity of ecosystems. Among insects, butterflies play an important role as herbivores and pollinating agents (Kunte, 2000; Tiple *et al.* 2006) as they depend on pollen, nectar and foliage of specific plants (Nimbalkar *et al.* 2011) for their life process. Based on this inter dependence, the diversity of butterflies also reflects the plant diversity of the associated region (Padhye *et al.*, 2006). Not only this, butterflies support a wide range of parasites and predators, which are species specific. In an ecological perspective, butterflies are considered as models for landscape studies (Thomas and Malorie 1985). They are also very much sensitive to micro level changes in their habitat (Kremen 1992) and are good indicators of habitat quality assessment. Butterflies provide vital information regarding environmental conditions and are useful in environmental monitoring. The present study aims to know the butterfly species found in Nature Park, Kolkata and to prepare a baseline data regarding butterfly diversity.

### MATERIALS AND METHODS

#### Sampling site

The south western and eastern periphery of Kolkata and its surrounding urban areas have thousands of hectares of wetlands along with a wide variety of plant species. The whole area is known as Nature Park (Figure 1) and the present study on butterfly diversity was conducted within the geographic coordinates of the Nature Park

Figure 1. The location of Nature Park, Kolkata (Source: Google Earth)

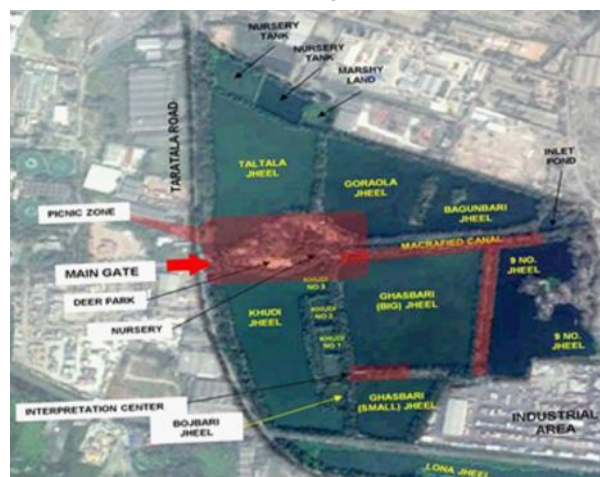


Table 1. List of Butterflies of Nature Park, Kolkata, recorded during the survey period

SI. No.	Common Name	Scientific Name	Family
01	Bush Hopper	<i>Ampittia dioscorides</i> (Fabricius, 1793)	Hesperiidae
02	Ceylon dart let	<i>Oriens goloides</i> (Moore, 1881)	Hesperiidae
03	Chestnut Bob	<i>Iambrix salsala</i> (Moore, 1866)	Hesperiidae
04	Common dart let	<i>Oriens gola</i> (Moore, 1877)	Hesperiidae
05	Common Redeye	<i>Matapa aria</i> (Moore, 1866)	Hesperiidae
06	Common small flat	<i>Sarangesa dasahara</i> (Moore, 1865)	Hesperiidae
07	Common Snow Flat	<i>Tagiades japetus</i> (Stoll, 1781)	Hesperiidae
08	Dark Palm Dart	<i>Telicota ancilla</i> (Herrich-Schäffer, 1869)	Hesperiidae
09	Grass Demon	<i>Udaspes folus</i> (Cramer, 1775)	Hesperiidae
10	Indian Palm Bob	<i>Suastus gremius</i> (Fabricius, 1798)	Hesperiidae
11	Indian Skipper	<i>Spialia galba</i> (Fabricius, 1793)	Hesperiidae
12	Pale Palm Dart	<i>Telicota colon</i> (Fabricius, 1775)	Hesperiidae
13	Rice Swift	<i>Borbo cinnara</i> (Wallace, 1866)	Hesperiidae
14	Tree Flitter	<i>Hyarotis adrastus</i> (Stoll, 1780)	Hesperiidae
15	Ciliate blue	<i>Anthene emolus</i> (Godart, 1824)	Lycaenidae
16	Common cerulean	<i>Jamides celeno</i> (Cramer, 1775)	Lycaenidae
17	Common line blue	<i>Prosotas nora</i> (C. and R. Felder, 1860)	Lycaenidae
18	Common Pier rot	<i>Castalius rosimon</i> (Fabricius, 1775)	Lycaenidae
19	Common silver line	<i>Spindasis vulcanus</i> (Fabricius, 1775)	Lycaenidae
20	Dark Cerulean	<i>Jamides bochus</i> (Stoll, 1782)	Lycaenidae
21	Dark grass blue	<i>Zizeeria karsandra</i> (Moore, 1865)	Lycaenidae
22	Forget me not	<i>Catochrysops strabo</i> (Fabricius, 1793)	Lycaenidae
23	Gram blue	<i>Euchrysops cnejus</i> (Fabricius, 1798)	Lycaenidae
24	Indian Sunbeam	<i>Curetis thetis</i> (Drury, 1773)	Lycaenidae
25	Lesser grass blue	<i>Pseudozizeeria maha</i> (Kollar, 1848)	Lycaenidae
26	Lime blue	<i>Chilades laius</i> (Stoll, 1780)	Lycaenidae
27	Monkey Puzzle	<i>Rathinda amor</i> (Fabricius, 1775)	Lycaenidae
28	Pale grass blue	<i>Pseudozizeeria maha</i> (Kollar, 1848)	Lycaenidae
29	Plains Cupid	<i>Euchrysops pandava</i> (Horsfield, 1829)	Lycaenidae
30	Quaker	<i>Neopithecops zalmora</i> (Butler, 1870)	Lycaenidae
31	Slate Flash	<i>Rapala manea</i> (Hewitson, 1863)	Lycaenidae
32	Striped Pier rot	<i>Tarucus nara</i> (Kollar, 1848)	Lycaenidae
33	Tiny grass blue	<i>Zizula hylax</i> (Fabricius, 1775)	Lycaenidae
34	Yam fly	<i>Loxura atymnus</i> (Stoll, 1780)	Lycaenidae
35	Zebra blue	<i>Tarucus plinius</i> (Fabricius, 1793)	Lycaenidae
36	Angled Castor	<i>Ariadne ariadne</i> (Linnaeus, 1758)	Nymphalidae
37	Black Raja	<i>Charaxes solon</i> (Fabricius, 1793)	Nymphalidae
38	Blue tiger	<i>Tirumala limniace</i> (Cramer, 1775)	Nymphalidae
39	Brown king crow	<i>Euploea klugii</i> (Moore, 1858)	Nymphalidae
40	Chestnut streaked Sailer	<i>Neptis jumbah</i> (Moore, 1857)	Nymphalidae
41	Commander	<i>Moduza procris</i> (Cramer, 1777)	Nymphalidae

Table 1. List of Butterflies of Nature Park, Kolkata, recorded during the survey period

Sl. No.	Common Name	Scientific Name	Family
42	Common Baron	<i>Euthalea aconthea</i> (Cramer, 1777)	Nymphalidae
43	Common bush brown	<i>Mycalesis perseus</i> (Fabricius, 1775)	Nymphalidae
44	Common Castor	<i>Ariadne merione</i> (Cramer, 1779)	Nymphalidae
45	Common crow	<i>Euploea core</i> (Cramer, 1780)	Nymphalidae
46	Common evening brown	<i>Melanitis leda</i> (Linnaeus, 1758)	Nymphalidae
47	Common five ring	<i>Ypthima baldus</i> (Fabricius, 1775)	Nymphalidae
48	Common four ring	<i>Ypthima huebneri</i> (Kirby, 1871)	Nymphalidae
49	Common Leopard	<i>Phalanta phalantha</i> (Drury, 1773)	Nymphalidae
50	Common palm fly	<i>Elymnias hypermenstra</i> (Linnaeus, 1758)	Nymphalidae
51	Common Sailer	<i>Neptis hylas</i> (Moore, 1758)	Nymphalidae
52	Common three ring	<i>Ypthima asterope</i> (Klug, 1832)	Nymphalidae
53	Dan aid Egg fly	<i>Hypolimnas misippus</i> (Linnaeus, 1758)	Nymphalidae
54	Dark blue tiger	<i>Tirumala limniace</i> (Cramer, 1775)	Nymphalidae
55	Dark brand bush brown	<i>Mycalesis mineus</i> (Linnaeus, 1758)	Nymphalidae
56	Great Egg fly	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	Nymphalidae
57	Grey Pansy	<i>Junonia atlites</i> (Linnaeus, 1763)	Nymphalidae
58	Lemon Pansy	<i>Junonia lemonias</i> (Linnaeus, 1758)	Nymphalidae
59	Peacock Pansy	<i>Junonia almana</i> (Linnaeus, 1758)	Nymphalidae
60	Plain tiger	<i>Danaus chrysippus</i> (Linnaeus, 1758)	Nymphalidae
61	Striped tiger	<i>Danaus genutia</i> (Cramer, 1779)	Nymphalidae
62	Common Blue bottle	<i>Graphium sarpedon</i> (Linnaeus, 1758)	Papilionidae
63	Blue Mormon	<i>Papilio polymnestor</i> (Cramer, 1775)	Papilionidae
64	Common Emigrant	<i>Catopsilia pomona</i> (Fabricius, 1775)	Papilionidae
65	Common Jay	<i>Graphium doson</i> (C. and R. Felder, 1864)	Papilionidae
66	Common Mime	<i>Papilio clytia</i> (Linnaeus, 1758)	Papilionidae
67	Common Mormon	<i>Papilio polytes</i> (Linnaeus, 1758)	Papilionidae
68	Common Rose	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	Papilionidae
69	Crimson Rose	<i>Pachliopta hector</i> (Linnaeus, 1758)	Papilionidae
70	Tailed Jay	<i>Graphium agamemnon</i> (Linnaeus, 1758)	Papilionidae
71	Common Albatross	<i>Appias albina</i> (Boisduval, 1836)	Pieridae
72	Common grass yellow	<i>Eurema hecabe</i> (Linnaeus, 1758)	Pieridae
73	Common grass yellow	<i>Eurema hecabe</i> (Linnaeus, 1758)	Pieridae
74	Common Gull	<i>Cepora nerissa</i> (Fabricius, 1775)	Pieridae
75	Common Jezebel	<i>Delias eucharis</i> (Drury, 1773)	Pieridae
76	Common Wanderer	<i>Pareronia valeria</i> (Cramer, 1776)	Pieridae
77	Mottled Emigrant	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	Pieridae
78	Pioneer	<i>Anaphaeis aurota</i> (Fabricius, 1775)	Pieridae
79	Psyche	<i>Leptosia nina</i> (Fabricius, 1793)	Pieridae
80	Striped Albatross	<i>Appias libythea</i> (Fabricius, 1775)	Pieridae
81	Three spot grass yellow	<i>Eurema blanda</i> (Boisduval, 1836)	Pieridae
82	Yellow Orange Tip	<i>Ixias pyrene</i> (Linnaeus, 1764)	Pieridae

(22° 31' 23"-22° 33' 00" N and 88° 17' 15"- 88° 18' 26" E). The whole area comprises more than 120 species of plants including macrophytes, climbers, herbs, shrubs and trees. The water body and greenery attracts a wide range of birds and butterflies.

#### Data Collection

To assess the diversity of butterflies, the sampling site was surveyed for a period of one year from July, 2012 to June, 2013. The whole study was divided into three seasonal observations, mainly pre-monsoon (March - June), monsoon (July - October) and post-monsoon (November - February). Study site was explored throughout the day from morning (8.00AM) to afternoon (5:00 PM), once a month in the three seasons. Bad weather conditions including strong wind and heavy rains were avoided. For the survey of butterflies Pollard Walk Method (Pollard 1977; Pollard and Yates, 1993) was used. Butterflies were counted within 2.5 meters on either sides of the fixed path throughout the wetland areas within Nature Park. Butterflies were identified in the field using field guides (Evans 1932; Wynter-Blyth 1957; Haribal 1992; Kunte 2000; Kehimkar 2008). In few cases butterflies were captured with the help of hand net (Tiple, 2012) and after identification they were released at the same spot immediately, with minimum disturbance.

#### RESULTS AND DISCUSSION

Although Nature Park is well known for its rich biodiversity of avian species, the area also shows a rich occurrence of butterfly species. During the whole study period, eighty-two butterfly species belonging to five families have been observed (Table 1). Nymphalidae family showed the maximum number of species (26 species, 31.70%), followed by Lycaenidae

(21 species, 25.60%), Hesperidae (14 species, 17.07%), Pieridae (12 species, 14.63%) and Papilionidae (9 species, 10.97%). The graphical representation of butterfly families is depicted in figure 2.

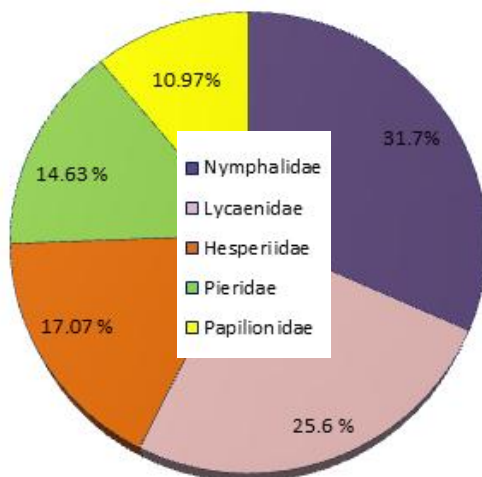
#### SUMMARY AND CONCLUSION

Butterflies have a crucial role in habitat quality assessment. The present study revealed eighty two butterfly species of five different families indicating a good butterfly diversity of the study site. The study also reveals the preference of some butterfly families mainly Nymphalidae and Lycaenidae towards particular habitats which are rich in floral species.

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Fig. 2. Relative share of various families of Butterflies visiting the Nature Park



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