

# Diversity of Butterflies Around Panje - Funde Wetland, Uran, Navi Mumbai West Coast of India

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**Abstract:** Uran is under heavy process of Urbanization, Industrialization, land filling, reclamation cutting of mangroves, shipping and port related activities resulting in fragmentation of natural habitats. Butterflies are bio-indicators of habitat quality and are sensitive to any changes taking place in habitat a survey of butterfly diversity of Panje –Funde wetland and nearby area was conducted for a period of one year from June 2017 to May 2018. During present investigation total of 66 species of butterflies belonging to 46 genera and 6 families were recorded. Butterflies from family Nymphalidae showed maximum species diversity dominance with 17 genera and 27 species followed by Lycaenidae with 10 genera and 10 species, Pieridae with 9 genera and 15 species Hesperidae with 6 genera and 6 species, Papilionidae represented with 3 genera and 6 species, the least number of 1 genus and 2 species were recorded from the family Riodinidae. There is urgent need for effective habitat and biodiversity conservation program in this Eco sensitive area.

**Keywords:** Butterflies, Panje, Wetland, Diversity.

## I. INTRODUCTION

Insects represent the vast majority species in almost all types of ecosystems. India is one among the twelve mega biodiversity countries of the world and that 80% of the insects are endemic in India Murugan, (2006). Among insects, butterflies have proved to be invaluable flagship species for conservation, Thomas, (2005). Butterflies being very sensitive towards any type of change in their habitat are considered as excellent Biological Indicators, (Parmesan et al. 1999). They are known for their pollination services and as key indicators of environmental health, Oostermeijer, and Van swaay, (1998). Butterflies have been studied systematically since early 18th century, so far 19,238 species documented worldwide of which, 1,504 species occur in India with 100 (15%) endemic and 26 (1.08%) globally threatened species in peninsular India, 334 butterfly species were reported from the Western Ghats and 150 species from the Eastern Ghats region, Ashish (2012). Butterflies are scaled wing insects belonging to the order Lepidoptera of class Insecta, Tanmoy and Ghosh (2016). Butterflies (Lepidoptera) the lovely and graceful insects provide economic and ecological benefits to the human society Guptha, (2012). Butterflies lives in specific habitats. Females lay their eggs on specific plants. As they have one or more generations in one year, their populations can change quickly. The trends of their populations can be detected in a short period of time. These make butterflies as sensitive indicators of the environment and are being used to assess climate change and environment changes. Vaan Swaay and Warren (2012), New et al., (1995) Griffis et al., (1999), Ehrlich, (1984). Uran is under heavy process of Urbanization, Industrialization, land filling, reclamation cutting of mangroves, shipping and port related activities resulting in fragmentation of natural habitats. Upcoming fourth port at JNPT, Special Economic Zone (SEZ) development and port related activities have placed tremendous pressure on the Panje –Funde wetland ecosystems.

## II. STUDY AREA

The Panje-Phunde wetland is located in Uran, Navi Mumbai in Raigad district of Maharashtra west coast of India. It is a major bird watching site in Mumbai Metropolitan Region (MMR). The wetland is home to migratory birds in the winter. The core wetland area at Panje covers 213 hectares is the last surviving wetland at Uran. The buffer area of 157 hectares is mangroves. Panje consists of a mix of habitats including freshwater and saline marshes, reeds, mangroves, grasslands, scrub and salt pans. Adjacent to Phunde- Panje wetland lies Veer Wajekar College with its

4.76 hectares area with variety of tree plantation and JNPT Township with hundreds of different varieties of trees provide very suitable environment for butterflies.

Panje –Phunde proposed bird sanctuary (Lat.18°53’52.38’’Nand Long.72°57’07.07’ is positioned in between Uran city and Jawaharlal Nehru Port. Panje site is having all in one habitats like wetland, mud flats, coast, mangroves vegetation Paddy fields and human dwellings. Jawaharlal Nehru Port (JNP) is the biggest container handling port in India, handling around 44% of the country’s containerized cargo, crossing the historic landmark of 4 million TEUs in container consecutively for the last five years. Shipping, shipbuilding, and port support are major economic factors in Uran. Along with JNPT, container terminals include APM Terminals (formerly GTI) and NSICT- DPWorld. Foundation of the Port- Based Multi-product Special Economic Zone (SEZ) layed at the prestigious Jawaharlal Nehru Port Trust (JNPT) at Sheva, Navi Mumbai in 2014. To evaluate the impact of all these developmental activities the present study is undertaken.

### III. MATERIALS AND METHOD

The study area was surveyed for a period of one year from June 2017 to May 2018 to assess the biodiversity of butterflies. The study area was trailed to record the diversity of butterflies. All Out Search sampling strategy was adopted for the study and every species encountered during the survey was recorded. Field observations were conducted following Pollard (1977), Walk Method. Field survey was done during 9.00am to 12.00am and 3.00 pm to 5.00pm every fortnightly. The identification was done with the keys Kunte(2000), Kehimkar (2008), Kasambe (2012), Nelson, (2013).

### IV. RESULT AND DISCUSSION

**Table 1:** The checklist of butterflies observed during June 2017 to May 2018 at Panje-Phunde Wetland

SR. No.	Family	Scientific Name	Common Name	Status
	<b>Hesperiidae</b>			
1.		<i>Borbo cinnara</i> (Wallace, 1866)	Rice Swift	VC
2.		<i>Hasora badra</i> (Moore, 1858)	Common Awl	C
3.		<i>Iambrix salsala</i> (Moore, 1866)	Chestnut Bob	NC
4.		<i>Parnara guttatus</i> (Bremer & Grey, 1852)	Straight Swift	C
5.		<i>Sarangessa purendra</i> (Moore, 1882)	Spotted Small Flat	R
6.		<i>Udaspes folus</i> (Cramer, 1775)	Grass demon	C
	<b>Lycaenidae</b>			
7.		<i>Abisara echerius</i> (Moore, 1878)	Plum Judy	VC
8.		<i>Castalius rosimon</i> (Fabricius, 1775)	Common Pierrot	C
9.		<i>Euchrysops cnejus</i> (Fabricius, 1798)	Gram Blue	VC
10.		<i>Jamides celeno</i> (Cramer, 1775)	Common Cerulean	C
11.		<i>Lampides boeticus</i> (Linnaeus, 1767)	Pea Blue	C
12.		<i>Leptotes plinius</i> (Fabricius, 1793)	Zebra Blue	NC
13.		<i>Luthrodes pandava</i> (Horsfield, 1829)	Plains Cupid	C
14.		<i>Surendra quercetorum</i> (Moore, 1857)	Common Acacia Blue	C
15.		<i>Talicauda nyseus</i> (Guérin-Meneville, 1843)	Red Pierrot	NC
16.		<i>Tarucus ananda</i> (de Nicéville, 1884)	Dark Pierrot	C
	<b>Nymphalidae</b>			
17.		<i>Acraea violae</i> (Horsfield, 1829)	Tawny Coster	C
18.		<i>Ariadne merione</i> (Cramer 1777)	Common Castor	C
19.		<i>Charaxes solon</i> (Fabricius, 1781)	Black Rajah	R
20.		<i>Danaus chrysippus</i> (Linnaeus, 1758)	Plain Tiger	VC
21.		<i>Danaus genutia</i> (Cramer, 1779)	Striped Tiger	VC

22.		<i>Euploea core</i> (Cramer, 1780)	Common Crow	VC
23.		<i>Euthalia aconthea</i> (Cramer, 1777)	Common Baron	C
24.		<i>Hypolimnas bolina</i> (Linnaeus, 1758)	Great Eggfly	VC
25.		<i>Hypolimnas misippus</i> (Linnaeus, 1764)	Danaid Eggfly	VC
26.		<i>Junonia almana</i> (Linnaeus, 1758)	Peacock Pansy	C
27.		<i>Junonia atlites</i> (Johanssen, 1764)	Grey Pansy	VC
28.		<i>Junonia hierta</i> (Evans, 1923)	Yellow Pansy	C
29.		<i>Junonia iphita</i> (Cramer, 1779)	Chocolate Pansy	VC
30.		<i>Junonia lemonias</i> (Linnaeus, 1758)	Lemon Pansy	VC
31.		<i>Junonia orithya</i> (Linnaeus, 1758)	Blue Pansy	NC
32.		<i>Kallima horsfieldi</i> (Kollar, 1844)	Sahyadri Blue Oakleaf	NC
33.		<i>Melanitis leda</i> (Linnaeus, 1758)	Common Evening Brown	VC
34.		<i>Melanitis phedima</i> (Cramer, 1780)	Dark Evening Brown	VC
35.		<i>Mycalasis mineus</i> (Linnaeus, 1758)	Dark-brand Bushbrown	C
36.		<i>Mycalasis perseus</i> (Fabricius, 1798)	Common Bush brown	NC
37.		<i>Neptis hylas</i> (Moore, 1872)	Common Sailer	VC
38.		<i>Neptis jumbah</i> (Moore, 1858)	Chestnut-streaked Sailer	NC
39.		<i>Parantica aglea</i> (Moore, 1883)	Glassy Tiger	VC
40.		<i>Phalanta phalantha</i> (Drury, 1770)	Common Leopard	VC
41.		<i>Tirumala limniace</i> (Cramer, 1775)	Blue tiger	VC
42.		<i>Vanessa cardui</i> (Linnaeus, 1758)	Painted Lady	NC
43.		<i>Ypthima huebneri</i> (Kirby, 1871)	Common Four Ring	NC
	<b>Pieridae</b>			
44.		<i>Appias albina</i> (Boisduval, 1836)	Common Albatross	R
45.		<i>Catopsilia pomona</i> (Fabricius, 1775)	Common Emigrant	C
46.		<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	Mottled Emigrant	C
47.		<i>Cepora nerissa</i> (Moore, 1857)	Common Gull	VC
48.		<i>Colotis amata</i> (Cramer, 1775)	Small Salmon Arab	VC
49.		<i>Colotis etrida</i> (Boisduval, 1836)	Small Orange Tip	C
50.		<i>Eurema brigitta</i> (Wallace, 1867)	Small Grass Yellow	C
51.		<i>Eurema hecabe</i> (Moore, 1886)	Common Grass Yellow	VC
52.		<i>Eurema laeta</i> (Moore, 1906)	Spotless Grass Yellow	C
53.		<i>Eurema nilgiriensis</i> (Yata, 1990)	Nilgiri Grass Yellow	C
54.		<i>Hebomoia glaucippe</i> (Linnaeus, 1758)	Great Orange Tip	VC
55.		<i>Ixias marianne</i> (Cramer, 1779)	White Orange Tip	VC
56.		<i>Ixias pyrene</i> (Butler, 1989)	Yellow Orange Tip	C
57.		<i>Leptosia nina</i> (Fabricius, 1793)	Psyche	VC
58.		<i>Pareronia hippia</i> (Fabricius, 1787)	Common Wanderer	VC
	<b>Papilionidae</b>			
59.		<i>Graphium Agamemnon</i> (Linnaeus, 1758)	Common tailed jay	C
60.		<i>Graphium doson</i> (C. & R. Felder, 1864)	Common Jay	C
61.		<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	Common Rose	C
62.		<i>Papilio demoleus</i> (Linnaeus, 1758)	Lime butterfly	C
63.		<i>Papilio polymnestor</i> (Cramer, 1775)	Blue Mormon	R
64.		<i>Papilio polytes</i> (Linnaeus, 1758)	Common Mormon	C

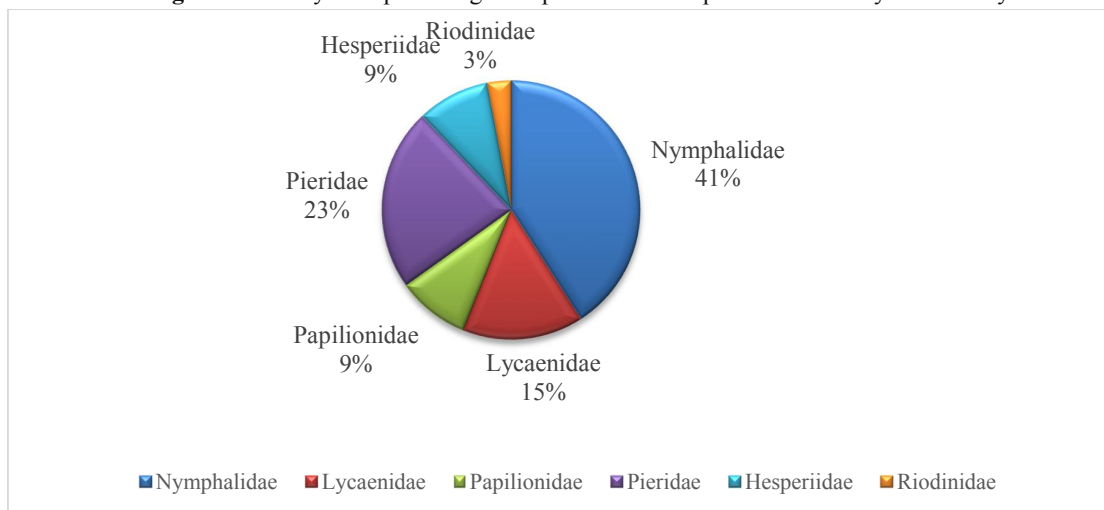
	<b>Riodinidae</b>			
65.		<i>Abisara bifasciata</i> (Moore, 1877)	double-banded Judy	NC
66.		<i>Abisara echerius</i> (Stoll, 1790)	Plum Judy	NC

VC- Very Common, C- Common, NC- Not common, R- Rare

**Table-2:** Family wise composition of the species of butterfly in the study area.

Sr. No.	Family	Genus	Species	%	VC	C	NC	R
1.	Hesperiidae	06	06	09.09	1	3	1	1
2.	Lycaenidae	10	10	15.15	2	6	2	-
3.	Nymphalidae	17	27	40.90	14	6	6	1
4.	Papilionidae	03	06	09.09	-	5	-	1
5.	Pieridae	09	15	22.72	7	7	-	1
6.	Riodinidae	01	02	03.03	-	-	2	-

**Figure 1:** Family wise percentage composition of the species of butterfly in the study area.



## V. DISCUSSION

During present investigation total of 66 species of butterflies belonging to 46 genera and 6 families were recorded (Tables 1). Butterflies from family Nymphalidae showed maximum species diversity dominance with 17 genera and 27 species followed by Pieridae with 9 genera and 15 species, Lycaenidae with 10 genera and 10 species and Hesperidae with 6 genera and 6 species, Papilionidae represented with 3 genera and 6 species, the least number of 1 genus and 2 species were recorded from the family Riodinidae (Table: 1). Butterflies from family Nymphalidae showed maximum species diversity dominance with 27 species (41%) followed by family Pieridae consisting 15 species (23%), Lycaenidae represented by 10 species (15%), family Hesperidae consisting 6 species (9%) and family Papilionidae consisting 6 species (9%) and Riodinidae recorded the least number of species diversity with 2 species (3%) (Table: 1). 24 species were found to be very common, 27 species were common, 11 species were not common whereas 4 species were recorded as rare species. As previous records are not available loss of diversity is not clear.

Availability of food (host plant and nectar plant) and microclimate are the main factors affecting butterfly diversity largely Öckinger et al; (2006), Öckinger et al;(2009), Mukherjee and Mukhopadhyay (2012), Mukherjee and, Ghosh (2018). The study area, college and township campus are rich in vegetation serving as foods for butterflies, therefore, better diversity of butterflies recorded.

Amongst the known butterflies of the world Family Nymphalidae represents nearly one-third of the total butterflies becoming largest family. During present investigation the highest biodiversity of Nymphalidae followed by Pieridae was

recorded. Similar results were also observed during Butterfly diversity in Bhopal, Madhya Pradesh, Harsh (2014), and Butterfly diversity in Kolkata, Mukherjee et al; (2015). Consistent with present data Preeti et al; (2017) during their study Diversity and Abundance of Butterflies at Owalekar Wadi, Thane and Shaikh and Chavan (2017), Butterfly diversity at Kharghar, Navi Mumbai has recorded highest biodiversity of nymphalidae.

#### **VI. CONCLUSION**

The checklist of butterflies recorded in this study will serve as baseline data for further studies as no scientific work till date has been done in this regard. Butterflies (Lepidoptera) the lovely and graceful insects provide economic and ecological benefits to the human society. They are known for their pollination services and as key indicators of environmental health. Further, systematic intensive studies on butterfly diversity are required to improve the list of butterfly species. Further studies should be conducted to understand the ecological health and diversity of this region and awareness should be created to generate help at local level in conservation activities. A total of four species of butterflies from the study area are designated rare, suggesting strict conservation measures as need of an hour.

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