

Butterfly Species Diversity and Abundance at Govt. Holkar Science College Campus, Indore

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Abstract—A study on butterfly was carried out at Holkar Science College Campus, Indore District, Madhya Pradesh, India, during 2020 to 2021. A total of 51 butterfly species were recorded. Family Nymphalidae (21) dominates in the study area, followed by Pieridae (11), Lycaenidae (11), Papilionidae (05) with minimum members of Hesperidae (03). Total larval food plants recorded from the campus are 41 belonging to different families. *Hygrophylla aericulata* were found most importance larval food plants as they supports the five pansies found here. The ratio of food plants and butterflies is near about 1:1. Plants of the Asteraceae family were more used by butterflies as nectar food plants. These findings are important with respect to butterfly diversity and abundance in planning conservation strategies in the area. The very common butterflies are Common jezebel, Common gull, Common emigrant, Mottled emigrant, Common grass yellow, Red Pierrot, Common castor, Chocolate pansy, Pale grass blue, Small grass jewel, Lemon pansy, Great egg fly, Danaid egg fly, Plain tiger and among very rare includes Lesser gul, Baronet, Grey pansy, Spot swordtail, Royal peacock, Commander, and Common wanderer. The study area is rich in butterfly diversity and further research could be conducted to obtained more details and documentation on butterfly diversity and abundance for the conservation and butterfly park.

Keywords— Butterfly diversity , abundance, larval food plants, conservation, Asteraceae.

I. INTRODUCTION

Butterflies are good indicators of climatic conditions, seasonal and ecological changes, they can also serve in formulating strategies for conservation. They are the most attractive insects belonging to the phylum Arthropoda and order lepidoptera. They are useful in studies of population and community ecology (Pollard 1991)[1] as bioindicators of ecosystem health because they are very sensitive to changes in microclimate and habitat (Erhardt 1985; Kremen 1992)[2] [3].

The relationship between and given butterfly species and its host plant is very specific. Among all the resources required by butterflies that comprise a habitat (Dennis *et al.* 2003, 2006)[4] [5], the larval host plants are the key resource, being fundamental for reproduction. Therefore, it is necessary to know the exact needs of the immature stages to make conservation successful larval host plants is still poor in the case of many butterfly species, especially in the tropics (Kunte 2000)[6].

The present study was carries out with a view to examine the Diversity and Abundance of butterfly population with reference to larval host plants at Holkar Science College, Indore city, India.

II. RELATED WORK

Recently Sharma *et. al.* (2013)[7] reported about 70 species of butterflies from Omkareshwar region. They have reported only four pansies from that large area; however we have found all the six pansies in our campus. This again indicates the richness of flora of this campus from butterfly's diversity and abundance point of view.

III. METHODOLOGY

The findings presented here are based on a field survey and investigations carried out on a daily basis from July 2020 to November 2021 at around of Holkar Science College Campus, Indore. In the said investigation the selected sites were surveyed mainly between 7:00 am to 11:00 am and 3:00 pm to 5:00 pm. (Kunte 2000)[6].

IV. RESULTS AND DISCUSSION

Total 51 butterfly's species from 5 families are enlisted during the present study. Family wise, the numbers of species are Nymphalidae- 21; Pieridae- 11; Lycaenidae- 11; Papilionidae- 05; Hesperidae- 03. Nymphalidae family dominates in the study area. Ixora, Jamaican spike, Snakeweed, Lantana, Zinnia, Cosmos, Peregrina mostly found to be used by butterflies as nectar food plants.

Table no:-1 Common name and frequencies of Butterflies at Holkar Science College Indore M.P.

S.N.	Common Name	Scientific Name	VC	C	R	VR
I. Family : PAPILIONIDAE						
1	Common Mormon	<i>Papilio polytes</i>		+		
2	Lime Butterfly	<i>Papilio demoleus</i>	+			
3	Tailed Jay	<i>Graphium Agamemnon</i>		+		
4	Common Jay	<i>Graphium sarpedon</i>			+	
5	Spot Swordtail	<i>Graphium nomius</i>				+
II. Family : PIERIDAE						
1	Common Jezebel	<i>Delis eucharis</i>	+			
2	Common Gull	<i>Cepora nerissa</i>	+			
3	Pioneer	<i>Anaphaeis aurota</i>		+		
4	White Orange Tip	<i>Ixias Marianne</i>			+	
5	Common Emigrant	<i>Catopsilia crocale Pomona</i>	+			
6	Mottled Emigrant	<i>Catopsilia pyranthe</i>	+			
7	Common Grass Yellow	<i>Eurema hecabe</i>	+			
8	Common Wanderer	<i>Pareronia valeria</i>				+
9	One Spots Grass Yellow	<i>Eurema andersonii</i>		+		
10	Spots Less Grass Yellow	<i>Eurema laeta</i>		+		
11	Lesser Gull	<i>Cepora nadina</i>				+
III. Family : LYCAENIDAE						
1	Red Pierrot	<i>Talicauda nyseus</i>	+			
2	Common Pierrot	<i>Castalius rosimon</i>		+		
3	Lime Blue	<i>Chilades laius</i>			+	
4	Zebra Blue	<i>Tarucus plinius</i>		+		
5	Pale Grass Blue	<i>Pseudozizeeria maha</i>	+			
6	Small Grass Jewel	<i>Chilades trochylus</i>	+			
7	Royal Peacock	<i>Tajuria cippus</i>			+	
8	Gram Blue	<i>Euchrysops cnejus</i>		+		
9	Common Cerulean	<i>Jamides celeno</i>			+	
10	Lesser Grass Blue	<i>Zizina otis</i>		+		
11	Small Cupid	<i>Chilades parrhasius</i>				+
IV. Family : NYMPHALIDAE						
1	Common Castor	<i>Ariadne merione</i>	+			
2	Common Leopard	<i>Phalanta phalantha</i>			+	
3	Peacock Pansy	<i>Junonia almana</i>		+		
4	Lemon Pansy	<i>Junonia lemonias</i>	+			
5	Baronet	<i>Euthalia nais</i> Forst			+	
6	Blue Pansy	<i>Junonia orithya</i>			+	
7	Yellow Pansy	<i>Junonia hierta</i>		+		
8	Chocolate Pansy	<i>Junonia iphita</i>	+			
9	Great Eggyfly	<i>Hypolimnas bolina</i>	+			
10	Tawny Coster	<i>Acraea violae</i>			+	
11	Common Sailor	<i>Neptis hylas</i>				+
12	Common Baron	<i>Euthalia aconthea</i>				+
13	Danaid Eggyfly	<i>Hypolimnas misippus</i>	+			
14	Gray Pansy	<i>Junonia atlites</i>			+	
15	Plain Tiger	<i>Danaus chrysippus</i>	+			
16	Commander	<i>Moduza procris</i>			+	
17	Blue Tiger	<i>Tirumala limniace</i>			+	
18	Common Crow	<i>Euploea core</i>	+			
19	Common Evening Brown	<i>Melanitis leda</i>			+	
20	Dark Evening Brown	<i>Melanitis phedima</i>		+		
21	Common Tiger	<i>Danaus genutia</i>			+	
V. Family: HESPERIIDAE						
1	Common Banded Awl	<i>Hasora chromus</i>			+	
2	Brown Awl	<i>Badamia exclamationis</i>			+	
3	Small Branded Swift	<i>Pelopidas mathias</i>				+

Note:- Very Common (VC), Common (C), Rare (R), and Very Rare (VR)

Table 2 List of Larval food plants recorded from Holkar Science College Campus. 2021

S.N.	Larval food plant	Common name	Name of Butterflies
1.	<i>Diospyros melanoxylo, Shorea robusta</i>	Tendu, Sal	Baronet
2.	<i>Justicia procumbens, Lepidogathis prostrata</i>	Justicia	Blue Pansy
3.	<i>Asclepias curassavica</i>	Blood flower	Blue Tiger
4.	<i>Terminalia belerica</i>	Behra	Brown Awl
5.	<i>Hygrophila auriculata,</i>	Talimkhana	Chocolate Pansy
6.	<i>Mussaenda frondosa, Mitriyina parvifolia</i>	Mussaenda, Kadamb	Commander
7.	<i>Pongamia pinnata</i>	Karanj	Common Banded Awl
8.	<i>Mangifera indica</i>	Mango	Common Baron
9.	<i>Ricinus communis</i>	Arandi	Common Castor
10.	<i>Abrus precatorius</i>		Common Cerulean
11.	<i>Thevetia, Ficus racemosa, Ficus benghalensis, Carissa spinarum</i>	Kaner, Gular, Banyan, Jangali Karonda	Common Crow
12.	<i>Cassia fistula</i>	Amaltas	Common Emigrant
13.	<i>Oryza sativa, Heteropogon contortus</i>	Rice, Grasses	Common Evening Brown
14.	<i>Cassia tora, Caesalpinia pulcherrima</i>	Pawar, Peacock flower	Common Grass Yellow
15.	<i>Capparis zeylanica</i>	Capers	Common Gull
16.	<i>Polyalthia longifolia</i>	Ashok	Common Jay
17.	<i>Dendrophthoe falcata</i>	Mistletoe	Common Jezebel
18.	<i>Flacourtia montana</i>	Rnnantambut	Common Leopard
19.	<i>Aegle marmelos, Murraya koenigii, Citrus limon, Jasminum sambac</i>	Bael, Mita Neem, Orange, Dud Mogara	Common Lime
20.	<i>Aegle marmels, Jasminum sambac</i>	Bael, Dud Mogara	Common Mormon
21.	<i>Ziziphus jujuba</i>	Ber	Common Pierrot
22.	<i>Salmalia malabarica</i>	Red silk cotton	Common Sailor
23.			Common Tiger
24.	<i>Maerua oblongifolia</i>	Capers	Common Wanderer, Common Gull
25.	<i>Portulaca oleracea</i>	Purslane	Danaid Egg fly
26.	<i>Ischaemum timorense, Digitaria didactyla</i>		Dark Evening Brown
27.	<i>Vigna trilobata</i>		Gram Blue
28.	<i>Hygrophila auriculata</i>	Talimkhana	Gray Pansy
29.	<i>Portulaca oleracea</i>	Purslane	Great Egg fly
30.	<i>Hygrophila auriculata</i>	Talimkhana	Lemon Pansy
31.	<i>Desmodium triflorum, Desmodium heterophyllum</i>		Lesser Grass Blue
32.			Lesser Gull
33.	<i>Citrus limetta</i>	Nimbu	Lime Blue
34.	<i>Cassia fistula, Cassia tora</i>	Amaltas	Mottled Emigrant
35.	<i>Ventilago goughii</i>		One Spots Grass Yellow
36.	<i>Oxalis corniculata</i>	Khatti Buti	Pale Grass Blue
37.	<i>Hygrophila auriculata</i>	Talimkhana	Peacock pansy
38.	<i>Capparis spinosa</i>	Capers	Pioneer
39.	<i>Calotropis procera, Calotropis gigantea</i>	Aak	Plain Tiger
40.	<i>Bryophyllum pinnatum</i>	Patthar chatta	Red Pierrot
41.			Royal Peacock
42.	<i>Heliotropium sp.</i>	Pea pods	Small Grass Jewel
43.	<i>Polyalthia cerasoides, Miliusa tomentosa</i>	Champak	Spot Swordtail
44.	<i>Chamaecrista auricoma</i>	Chuumui	Spots Less Grass Yellow
45.	<i>Annona squamosa, Polyalthia longifolia</i>	Sitaphal, Ashok	Tailed Jay
46.	<i>Passiflora foetida</i>	Passion flower	Tawny Coster
47.	<i>Capparis sp.</i>	Capers	White Orange Tip
48.	<i>Hygrophila auriculata</i>	Talimkhana	Yellow Pansy
49.	<i>Plumbago zeylanica</i>	Chitrak	Zebra Blue

Identification of the butterflies was primarily made directly in the field. In critical condition, specimens were collected only with handheld aerial sweep nets. The observed butterflies were grouped in four categories on the basis of number of sighting in the field. The butterflies were categorized as Very Common (VC), Common (C), Rare (R), and Very Rare (VR) (Tiple *et al.* 2006, 2007)[8] [9].

V. CONCLUSION AND FUTURE SCOPE

The campus is rich and diversified with more than fourteen gardens and one developing Butterfly Park in the Department of Seed Technology. A large number of trees, shrubs and linas are growing here along with the large number of flowering plant, grass and sages. Thus the study region is abundant in nectar-containing flora and attractive blooming plants i.e. Ixora, Jamaican spike, Snakeweed, Lantana, Zinnia, Cosmos, Peregrina *Rosa indica*, *Hibiscus rosa sinensis*, *Nyctanthes arbor-tristis*, *Caesalpinia pulcherrima* etc. which encourage butterfly diversity and abundance, must be responsible for the newly discovered species. Some previously abundant known species now have been found rare in this investigation, while some new species have been discovered too. Its reason must be that All these factor are attributed to the rich diversity & abundance of butterflies here. The richness of butterflies clearly indicates the presences of a large number of larval food plants in college campus.

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