



## BUTTERFLY DIVERSITY IN RELATION TO A RELATIVE ABUNDANCE AND STATUS IN SELOO CITY, WARDHA MAHARASHTRA, CENTRAL INDIA

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### ABSTRACT:-

A survey was conducted to record the butterfly diversity and the status and occurrence of butterfly species in and around Seloo city, Central India from 2011 to 2018. A total of 91 species of butterflies belonging to Papilionidae (07 species), Pieridae (14 species), Nymphalidae (29 species), Lycaenidae (28 species), Hesperidae (12 species) and 01 species was recorded from the Riodinidae. Of all the total 91 species, 29% were commonly occurring, 46% were very common, 9% were not rare, 13% were rare and 3% were very rarely occurring. About 06 species of the recorded ones come under the protection category of the Indian Wild Life protection Act 1972. The observations support the value of the Seloo city area in providing valuable resources for butterflies.

**Keywords:** India, Lepidoptera, diversity, Seloo city, Maharashtra

### INTRODUCTION

Butterflies are the most beautiful and colourful creatures on the earth and have a great aesthetic value. Butterflies have always been a subject of interest and they are probably next only to birds in their universal popularity evoking curiosity and fondness among children, naturalists and scientist alike. This is partly attributable to the great variety and beauty of their colour patterns and partly to their aromatic transformation during mimicry and migration (Kunte, 2000). They constitute one of the most important links in ecological pyramids of food chain i.e. a link between plants and other predators like birds, reptiles and spiders; transforming and transmitting energy from green plants to the animal. Amongst the invertebrates, butterflies are becoming sufficiently well studied for them to be used for general conservation planning in some parts of the tropics as a representative insect group (Thomas, 1992).

Butterflies are very sensitive biota to environment and are directly affected by changes in the habitats, atmospheric temperature and the weather conditions; they can be good indicators of environment changes (Tiple et al., 2006). Most of the butterflies are seasonal in their occurrence, they are abundant only from beginning of monsoon (June–July) till the early winter (August–November) and decline in species abundance from late winter

(December–January) up to the end of summer (Tiple and Khurad 2009).

Butterflies have been studied systematically since the early 18<sup>th</sup> century and about 19,238 species are documented worldwide by 1998 (Heppner, 1998). This figure is not constant because of the continuous addition of new butterflies and also due to ongoing disagreements between taxonomists over the status of many species.

The Indian subcontinent a diverse terrain, climate and vegetation hosts about 1,504 species of butterflies (Tiple 2011) of which Peninsular India hosts 351, and the Western Ghats 336. In Central India, the butterfly diversity was reported earlier by Forsayeth, (1884); Swinhoe, (1886); Betham, (1890, 1891) & Witt, (1909). D'Abreeu, (1931) documented a total of 177 species occurring in the erstwhile Central Provinces (now Madhya Pradesh and Vidarbha). In the recent past, several workers have studied butterflies from urban, rural and protected areas of Vidarbha. 65 species belonging to 52 genera representing 7 families from Pench Tiger Reserve, (Maharashtra) (Sharma & Radhakrishnan, 2005); 68 species of butterflies of 50 genera were recorded from Tadoba Andhari Tiger Reserve (Sharma & Radhakrishnan, 2006) and 103 species of butterflies were recorded from Melghat Tiger Reserve (Wadatkar, 2008). Tiple & Khurad, (2009) reported 145 species of butterflies recorded, of which 62 species were new records

for Nagpur city. Recently, Tiple, 2010 documented 111 species of butterflies in Tadoba National Park.

The present study was started with a view to examine the diversity of butterfly from Seloo city. Since there is no published checklist of butterfly from Seloo city prior to this, the present work can form the baseline for further research.

#### **MATERIAL AND METHOD**

The Seloo city (20°83'73"N; 78°70'70"E; 265 m) is situated nearer to Bor Wildlife Sanctuary at the bank of river Bor along with the dense shrub, natural vegetation and tree vegetation which are the major attraction to the butterflies. It has tropical wet and dry climate with dry conditions, an annual rainfall of about 1,205 mm (June to September); temperature raises up to 48.9°C during summer (March-June) and falls up to 10°C to 6.9°C in winter (November-January). Annual relative humidity varies in between 22% to 80% (Tiple 2011).

The findings presented here are based on field surveys carried out on weekly basis from 2011 to 2018 at in and around Seloo city. Butterfly were surveyed in Seloo city and surrounding areas. Identification of the butterflies was primarily made directly in the field. In critical condition specimens were collected only with handheld aerial sweep nets and subsequently released without harm. Each specimen was placed in plastic bottles and carried them to the laboratory for further identification with the help of field guide (Wynter-Blyth, 1957; Kunte, 2000). The observed butterflies were grouped in five categories on the basis of number of sighting in the field. The butterflies were categorized as VC- Very common (> 100 sightings), C- Common (51-100 sightings), NR- Not rare (16-50 sightings), R- Rare (2-15 sightings), VR- Very rare (< 2 sightings) (Tiple and Khurad 2009).

#### **RESULTS AND DISCUSSION**

During the course of study 91 species of butterflies belonging to 6 families, were recorded. The highest number of butterflies belongs to the family Nymphalidae (29 species). Followed by the Lycaenidae 28 species, 14 species to Pieridae, 12 species to Hesperidae, 07 species to Papilionidae and 01 species was recorded from the Riodinidae.

Among the 112 species of butterflies about 29 % (26) were occurring common, 46%

(42) species were very common, 9% (08) were not rare, 13% (12) were rare, and 3% (03) were very rare (i.e. *Graphium nomius*, *Ixias pyrene*, *Jamides bochus*). The observed and identified species, their status in and around of Seloo city are listed in Table 1.

Among the 91 butterflies recorded, 05 species come under the protection category of the Indian Wild Life (protection) Act 1972 (Tiple, 2011; Gupta & Mondal, 2005) (i.e. *Pachliopta hector*, *Euploea core*, *Hypolimnas misippus*, *Euchrysops cnejus*, *Lampides boeticus*). As reported by Kunte (2000), an objective revision of the scheduled list is necessary in providing appropriate and adequate legal protection to Indian butterflies.

In India we have two peak seasons, March-April and October-November for butterfly abundance (Wynter-Blyth (1957). The abundances of diverse species were positively affected by approaching summer, high relative humidity and more rainfall. In the present investigation most butterfly species were observed from the monsoon (hot/wet season) to early winter (cool/wet season) but subsequently declined in early summer (March). Among the 91 species of butterflies, *Papilio demoleus*, *Pachliopta aristolochiae*, *Catopsilia pomona*, *Eurema hecabe*, *Danaus chrysippus*, *Tirumala limniace*, *Acraea violae*, *Euploea core*, *Junonia lemonias*, *Catochrysops strabo*, *Chilades putli* were occurred throughout the year (January-December), whereas remaining 80 species of butterflies were prominently observed only after June-July till the beginning of summer (April-May). Increasing species abundance from beginning of monsoon (June-July) till the early winter (August-November) and decline in species abundance from late winter (January - February) up to the end of summer (Fig. 1) have also been reported by Tiple et al. (2007); Tiple and Khurad (2009) and Tiple 2012 in similar climatic conditions in this region of Central India.

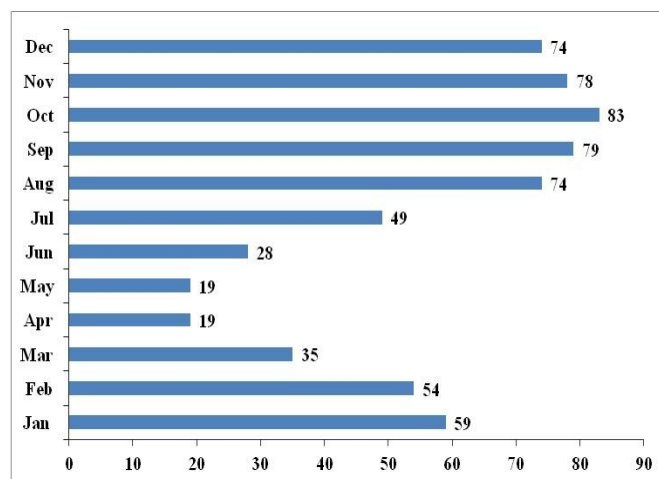
The findings of the present study underline the importance of city as a preferred habitat for butterflies. If the landscaping and maintenance of gardens are carefully planned, the diversity of butterflies may increase in Seloo city providing a rich ground for butterfly conservation as well as for research. This study will also add to our future attempts in understanding the complex nature of

mutualistic interaction between butterflies and flowering plants that is essential for continuity of ecosystem services. The present list of butterfly species is not conclusive and exhaustive and future exploration will be continued to update this checklist.

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**Figure 1.** The variations of species composition throughout the year in Seloo city



**Table 1.** List of butterflies recorded from Seloo city together with common name, status and Occurrence.

Sr. No.	Scientific Name	Common Name	Status	Occurrence (months)
<b>Papilionidae (07)</b>				
1.	<i>Graphium agamemnon</i> (Linnaeus, 1758)	Tailed Jay	C	8-1
2.	<i>Graphium doson</i> (C. & R. Felder, 1864)	Common Jay	NR	8-1
3.	<i>Graphium nomius</i> (Esper, 1799)	Spot Swordtail	VR	3-7
4.	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	Common Rose	C	7-2
5.	<i>Pachliopta hector</i> (Linnaeus, 1758)	Crimson Rose	C	7-2
6.	<i>Papilio demoleus</i> Linnaeus, 1758	Lime Butterfly	VC	1-12
7.	<i>Papilio polytes</i> Linnaeus, 1758	Common Mormon	VC	7-2
<b>Pieridae (14)</b>				
8.	<i>Belenois aurota</i> (Fabricius, 1793)	Pioneer	VC	9-2
9.	<i>Catopsilia pomona</i> (Fabricius, 1775)	Common Emigrant	VC	1-12
10.	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	Mottled Emigrant	VC	7-2
11.	<i>Cepora nerissa</i> (Fabricius, 1775)	Common Gull	VC	1-12
12.	<i>Colotis danae</i> (Fabricius, 1775)	Crimson Tip	VC	6-10
13.	<i>Colotis etrida</i> (Boisduval, 1836)	Small Orange Tip	NR	8-12
14.	<i>Ixias pyrene</i> Linnaeus, 1764	Yellow Orange Tip	VR	8-9
15.	<i>Delias eucharis</i> (Drury, 1773)	Common Jezebel	VC	7-2
16.	<i>Eurema brigitta</i> (Stoll, [1780])	Small Grass Yellow	C	1-12
17.	<i>Eurema hecabe</i> (Linnaeus, 1758)	Common Grass Yellow	VC	1-12
18.	<i>Eurema laeta</i> (Boisduval, 1836)	Spotless Grass Yellow	VC	7-12
19.	<i>Ixias marianne</i> (Cramer, [1779])	White Orange Tip	C	8-11
20.	<i>Leptosia nina</i> (Fabricius, 1793)	Psyche	R	8-1
21.	<i>Pareronia hippie</i> (Cramer, [1776])	Common Wanderer	C	8-2
<b>Nymphalidae (29)</b>				
22.	<i>Acraea violae</i> (Fabricius, 1793)	Tawny Coster	VC	10-12
23.	<i>Ariadne ariadne</i> (Linnaeus, 1763)	Angled Castor	VC	9-2
24.	<i>Ariadne merione</i> (Cramer, [1777])	Common Castor	C	10-2
25.	<i>Byblia ilithyia</i> (Drury, [1773])	Joker	C	6-12
26.	<i>Charaxes solon</i> (Fabricius, 1793)	Black Rajah	R	10-2
27.	<i>Danaus chrysippus</i> (Linnaeus, 1758)	Plain Tiger	VC	1-12
28.	<i>Danaus genutia</i> (Cramer, [1779])	Striped Tiger	C	10-6
29.	<i>Euploea core</i> (Cramer, [1780])	Common Indian Crow	VC	1-12
30.	<i>Euthalia aconthea</i> Cramer, 1777	Common Baron	R	8-11
31.	<i>Hypolimnias bolina</i> (Linnaeus, 1758)	Great Eggfly	C	6-3
32.	<i>Hypolimnias misippus</i> (Linnaeus, 1764)	Danaid Eggfly	C	1-12
33.	<i>Junonia almana</i> (Linnaeus, 1758)	Peacock Pansy	VC	6-2
34.	<i>Junonia atlites</i> (Linnaeus, 1763)	Grey Pansy	VC	7-2
35.	<i>Junonia hierta</i> (Fabricius, 1798)	Yellow Pansy	NR	8-2
36.	<i>Junonia iphita</i> (Cramer, [1779])	Chocolate Pansy	VC	8-3
37.	<i>Junonia lemonias</i> (Linnaeus, 1758)	Lemon Pansy	VC	1-12
38.	<i>Junonia orithya</i> (Linnaeus, 1758)	Blue Pansy	VC	10-4
39.	<i>Melanitis leda</i> (Linnaeus, 1758)	Common Evening Brown	VC	1-12
40.	<i>Moduza procris</i> (Cramer, [1777])	Commander	C	8-1
41.	<i>Mycalesis mineus</i> (Linnaeus, 1758)	Dark Branded Bushbrown	R	8-3
42.	<i>Mycalesis perseus</i> (Fabricius, 1775)	Common Bushbrown	VC	7-3
43.	<i>Phaedyma columella</i> (Cramer, [1780])	Short-banded Sailer	R	9-11
44.	<i>Neptis hylas</i> (Linnaeus, 1758)	Common Sailer	VC	7-3
45.	<i>Phalanta phalantha</i> (Drury, [1773])	Common Leopard	VC	6-3
46.	<i>Symphaedra nais</i> (Forster, 1771)	Baronet	C	10-3
47.	<i>Tirumala limniace</i> (Cramer, [1775])	Blue Tiger	VC	1-12
48.	<i>Ypthima asterope</i> (Klug, 1832)	Common Threering	C	7-9
49.	<i>Ypthima huebneri</i> (Kirby, 1871)	Common Fourring	R	11-12

50.	<i>Ypthima inica</i> (Hewitson, 1865)	Lesser Threering	C	9-12
	<b>Riodinidae (1)</b>			
51.	<i>Abisara bifasciata</i> Moore, 1877	Double-banded Judy	R	8-10
	<b>Lycaenidae (28)</b>			
52.	<i>Acytolepis puspa</i> (Horsfield, [1828])	Common Hedge Blue	VC	9-2
53.	<i>Amblypodia anita</i> Hewitson, 1862	Leaf Blue	NR	8-9
54.	<i>Azanus jesous</i> (Guérin-Méneville, 1849)	African Babul Blue	C	10-2
55.	<i>Azanus ubaldus</i> (Stoll, [1782])	Bright Babul Blue	R	11-2
56.	<i>Castalius rosimon</i> (Fabricius, 1775)	Common Pierrot	VC	1-12
57.	<i>Catochrysops strabo</i> (Fabricius, 1793)	Forget-Me-Not	VC	1-12
58.	<i>Chilades lajus</i> (Stoll, [1780])	Lime Blue	VC	8-12
59.	<i>Luthrodes pandava</i> (Horsfield, [1829])	Plains Cupid	VC	1-12
60.	<i>Chilades parrhasius</i> (Fabricius, 1793)	Small Cupid	R	7-2
61.	<i>Freyeria putli</i> (Kollar, [1844])	Eastern Grass Jewel	C	7-12
62.	<i>Virachola isocrates</i> (Fabricius, 1793)	Common Guava Blue	NR	8-10
63.	<i>Euchrysops cnejus</i> (Fabricius, 1798)	Gram Blue	VC	6-3
64.	<i>Jamides bochus</i> (Stoll, [1782])	Dark Cerulean	VR	7-2
65.	<i>Jamides celeno</i> (Cramer, [1775])	Common Cerulean	VC	7-3
66.	<i>Lampides boeticus</i> (Linnaeus, 1767)	Pea Blue	VC	8-3
67.	<i>Leptotes plinius</i> (Fabricius, 1793)	Zebra Blue	VC	7-3
68.	<i>Prosotas nora</i> (Felder, 1860)	Common Lineblue	C	7-3
69.	<i>Psuedozizeeria maha</i> (Kollar, [1844])	Pale Grass Blue	C	8-3
70.	<i>Rapala iarbus</i> (Fabricius, 1787)	Common Red Flash	C	8-12
71.	<i>Spindasis ictis</i> (Hewitson, 1865)	Common Shot Silverline	NR	6-8
72.	<i>Spindasis schistacea</i> (Moore, [1881])	Plumbeous Silverline	C	7-8
73.	<i>Spindasis vulcanus</i> (Fabricius, 1775)	Common Silverline	VC	8-2
74.	<i>Tarucus balkanicus nigra</i> Bethune-Baker, [1918]	Black-spotted Pierrot	C	8-1
75.	<i>Tarucus callinara</i> Butler, 1886	Spotted Pierrot	C	8-2
76.	<i>Tarucus nara</i> (Kollar, 1848)	Rounded Pierrot/ Striped Pierrot	VC	7-2
77.	<i>Zizeeria karsandra</i> (Moore, 1865)	Dark Grass Blue	VC	1-12
78.	<i>Zizina otis</i> (Fabricius, 1787)	Lesser Grass Blue	VC	6-3
79.	<i>Zizula hylax</i> (Fabricius, 1775)	Tiny Grass Blue	VC	6-3
	<b>Hesperiidae (12)</b>			
80.	<i>Badamia exclamationis</i> (Fabricius, 1775)	Brown Awl	C	8-11
81.	<i>Borbo bevani</i> (Moore, 1878)	Bevan's Swift	R	8-11
82.	<i>Borbo cinnara</i> (Wallace, 1866)	Rice Swift	VC	1-12
83.	<i>Celaenorrhinus leucocera</i> (Kollar, [1844])	Common Spotted Flat	R	8-9
84.	<i>Coladenia indrani</i> (Moore, [1866])	Tricolour Pied Flat	NR	9-12
85.	<i>Hasora badra</i> (Moore, [1858])	Common Awl	C	7-9
86.	<i>Hasora chromus</i> (Cramer, [1780])	Common Banded Awl	VC	9-10
87.	<i>Pelopidas mathias</i> (Fabricius, 1798)	Small Branded Swift	VC	7-12
88.	<i>Spialia galba</i> (Fabricius, 1793)	Indian Skipper	R	8-3
89.	<i>Suastus gremius</i> (Fabricius, 1798)	Indian Palm Bob	NR	7-12
90.	<i>Telicota bambusae</i> (Moore, 1878)	Dark Palm Dart	VC	8-12
91.	<i>Telicota colon</i> (Fabricius, 1775)	Pale Palm Dart	C	7-10

