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(Maharashtra) India*

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## Butterfly Species Diversity and Abundance Status in Patan Tehsil of Satara District (Maharashtra) India

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### ABSTRACT

The present study was conducted to study the abundance and diversity of various butterfly species found in Patan tehsil by random observation during August 2018 to July 2019. The study area has peculiar vegetation being part of Western Ghats as well as development of agro-ecosystem. It is mixed type with herbs, shrubs and trees. There is species richness and diversity of butterfly fauna. A total of 50 species of butterflies belonging to Pieridae, Nymphalidae, Papilionidae, Hesperidae and Lycaenidae families have been recorded. Among the 50 species, number of species of family with its abundance as family Nymphalidae are 18 (40%), family Pieridae 11 species (39%), family Lycaenidae 11 species (13%), family Papilionidae 8 species (6%) and family Hesperidae 2 species (2%).

**Key words:** Abundance, Butterfly diversity, Western Ghats

Biodiversity is the variety of life on earth. It is in all its form within a given ecosystem, biome or entire Earth. A rich biodiversity is not only essential for maintaining the ability to adapt to changes but provides food, medicines, raw materials and many other ecosystem services. Biodiversity and ecosystem services provided by nature are of immense economic value [1]. Butterflies and moths are the indicators of healthy environment and healthy ecosystem. They indicate wide range of the invertebrates which comprise over two-third of all species. Butterflies and other pollinators like moths, bees, wasps, birds and bats pollinate 75% of world's flowering plants to help plants reproduce which help strengthen ecosystem and maintain life sustaining biological diversity in nature. These collectively provide wide range of environmental benefits including pollination and natural pest control. Butterflies are sensitive biotope and get severely affected by environmental changes [2-3]. Due to abundance and advanced taxonomy butterflies are identified as ideal indicator taxa of habitat disturbance [4]. Therefore, the presence of various species of Butterflies in an area assessed the conservation value of a habitat. Although, there are some checklists available on butterfly diversity, no study was conducted in Patan tehsil situated in Satara district in Maharashtra, India. Hence, an attempt was made to

understand the butterfly diversity in Patan tehsil through the present investigation.

### MATERIALS AND METHODS

Patan is a tehsil located in Satara district in Maharashtra state. It is at 17.37° N 73.9° E and at the altitude of 582 meters. Major observations were carried out at foot hills; plain areas. This is useful for clear observation. Human intervention in most of the study areas were less.

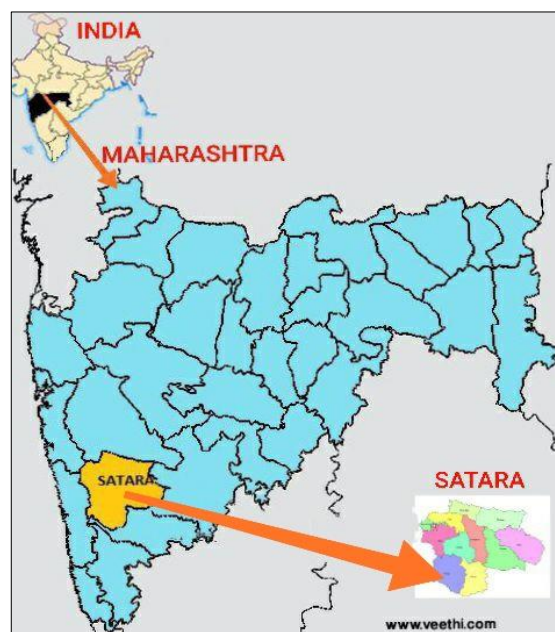


Fig 1 Showing study area

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Butterfly survey

The aim of study was to produce report of species of butterflies over short period of time. The study area was fully explored and then decided the probable areas from the Patan tehsil. The study area includes typically hilly area with plantation, forest, grasslands, gardens, agricultural area, road side area and open scrubs. The present study was carried out during August 2018 to July 2019. The selected habitats were visited regularly twice in a month for 3 to 5 days. During field visit in different agricultural and other forest areas visual observations were done by walking in different types of forest for example along road side, dense forest along river and lakes, grasslands around human habitat and gardens. Observations were done at a distance of 1 to 3 meter and identified by observing morphological features unidentified species were photographed and then identified later on with the help of butterfly field guide [5].

RESULTS AND DISCUSSION

A total of 50 species of butterflies with 253 individuals belonging to 5 families viz., Nymphalidae, Papilionidae, Pieridae, Lycaenidae, Hesperidae were recorded (with the help of photographic record done) during the study. The less disturbed areas like grassland, forest, open scrubs, Garden was found to highest species richness as compare to more disturbed areas like urbanized habitat. The Butterfly species number observed according to the habitat is noted in (Table 1). The abundance of butterflies in particular habitat is

associated with the availability of larval host plants and adult nectar plants. The study area is mixed type with herbs, shrubs and trees like *Mangifera indica*, *Lantana camera* and Grasses which provide diverse habitat, food and breeding sites for butterflies. The number of species of family with its abundance as family Nymphalidae are 18 (40%), family Pieridae 11 species (39%), family Lycaenidae 11 species (13%), family Papilionidae 8 species (6%) and family Hesperidae 2 species (2%) are shown in the (Fig 1-2). The family Nymphalidae is well distributed followed by Family Pieridae and family Lycaenidae in Patan tehsil. It was observed that some species are common some are uncommon and some are rare also the species like *Hypolimnas misippus* is in schedule II (part II) and *Euploea core* are listed in schedule IV of Wildlife (protection) Act, 1972.

Overall, we found that butterfly assemblage of open spaces, grasslands, gardens were considerably rich. Most of the known seasonal migrations of butterflies in the world are either latitudinal or altitudinal [6-7]. Both are somewhat similar; in that they are adapted mainly to escape adverse seasonal temperatures and host plant availability at very high altitudes and latitudes. An occasional butterfly migration that takes place in central India and North Western Ghats [8-10]. Most of the butterfly species are found in more than two different habitats. The area where the butterflies of particular species are found abundant is considered as habitat of that species. The abundance of butterflies is seasonal [11]. During the study the large numbers of Butterflies were observed during post monsoon season (August to November) [12].

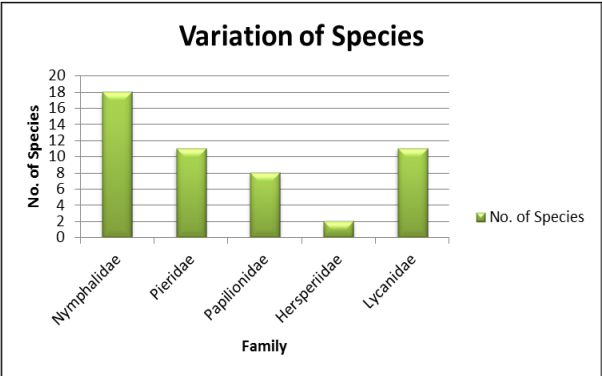


Fig 2 Distribution of families of butterflies

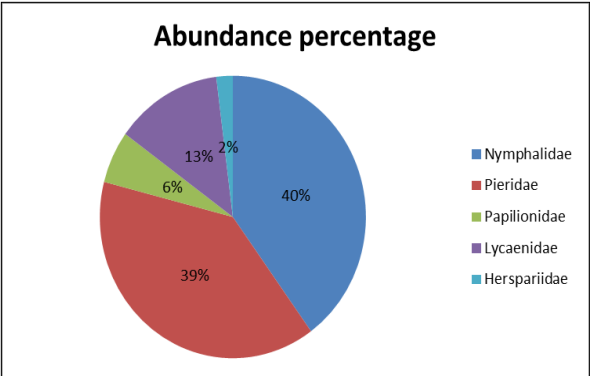


Fig 3 Distribution of species of butterflies in families



*Hypolimnas misippus*



*Ariadne merione*



*Junonia atlites*



*Danaus chrysippus*

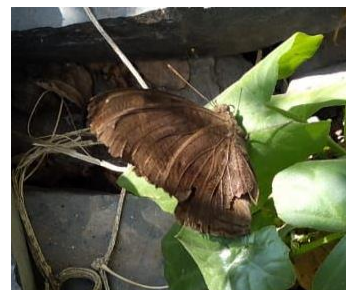
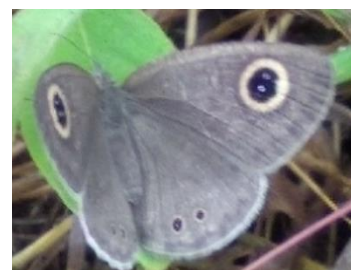
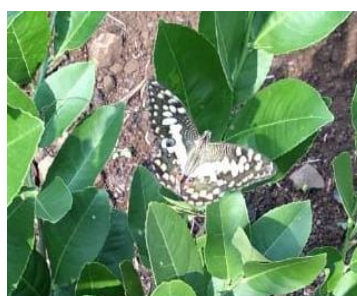
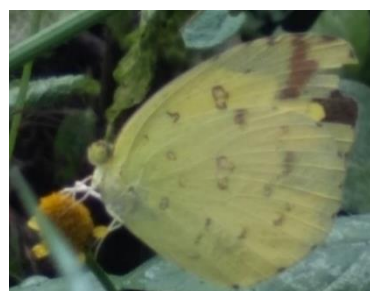
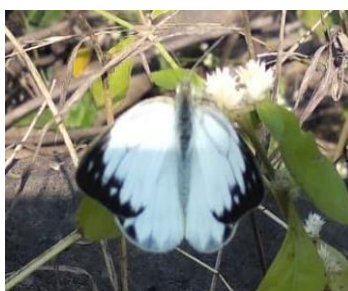


*Parantica aglea*



*Ypthima huebneri*



*Danaus genutia**Neptis hylas**Junonia orytha**Euploea core**Junonia almana**Melanitis phedima**Athyma selenophora**Euthalia aconthea**Ypthima baldus**Junonia lemonias**Melanitis leda**Appias libythia**Papilio polytes**Papilio demolius**Papilio dravidarum**Eurema andersoni**Appias libythea**Catopsilia pyranthe*





*Pareronia valeria*



*Eurema laeta*



*Catopsilia pomona*



*Pieris virginiensis*



*Nacaduba kurava*



*Talicada nuseus*



*Prosotas dubiosa*



*Leptotes plinius*



*Castalius rosimon*



*Azanus ubaldus*



*Catochrysops strabo*



*Pseudozizeeria maha*



*Spindasis syama*



*Tarucus nara*



*Chilades lajus*



*Hasara chromus*



*Pelopidas conjuncta*

Fig 4 Shows photos of butterfly species observed and captured during field study

Table 1 Checklist of the butterfly species and their number in different location

S. No.	Common name	Scientific name	Species No.	Location
Family – Nymphalidae (18)				
1	Danaid eggfly	<i>Hypolimnas misippus</i>	7	G
2	Common castor	<i>Ariadne merione</i>	3	G
3	Grey pansy	<i>Junonia atlites</i>	8	RS
4	Plain Tiger	<i>Danaus chrysippus</i>	12	OS
5	Glassy Tiger	<i>Parantica aglea</i>	3	OS
6	Common Tiger	<i>Danaus geutia</i>	10	OS
7	Common four ring	<i>Ypthima huebneri</i>	10	OS
8	Indian Common Sailor	<i>Neptis hylas</i>	2	AG
9	Blue pansy	<i>Junonia orytha</i>	12	GR
10	Common crow	<i>Euploea core</i>	5	OS
11	Peacock pancy	<i>Junonia almana</i>	2	AG
12	Dark evening brown	<i>Melanitis phedima</i>	3	GR
13	Lemon pansy	<i>Junonia lemonias</i>	5	RS
14	Staff sergeant	<i>Athyma selenophora</i>	1	OS
15	Common baron	<i>Euthalia aconthea</i>	2	G
16	Lesser three-ring	<i>Ypthima inica</i>	10	GR
17	Common five-ring	<i>Ypthima baldus</i>	3	GR
18	Common evening brown	<i>Melanitis leda</i>	3	GR
Family – Papilionidae (8)				
1	Common rose	<i>Pachliopta aristolochiae</i>	2	G
2	Red Helen	<i>Papilio helenus</i>	1	G
3	Malabar raven	<i>Papilio dravidarum</i>	2	RS
4	Common jay	<i>Graphium doson</i>	1	G
5	Tailed jay	<i>Graphium agamemnon</i>	3	G
6	Common mime	<i>Papilio clytia</i>	1	G
7	Common Mormon	<i>Papilio polytes</i>	2	G
8	Lemon butterfly	<i>Papilio demoleus</i>	4	G
Family – Pieridae (11)				
1	Small grass yellow	<i>Eurema brigitte</i>	20	OS
2	Common grass yellow	<i>Eurema hecabe</i>	10	OS
3	Spotless grass yellow	<i>Eurema laeta</i>	10	OS
4	Lemon emigrant	<i>Catopsilia pomona</i>	12	RS
5	Mottled emigrant	<i>Catopsilia pyranthe</i>	15	RS
6	Common wanderer	<i>Pareronia valeria</i>	3	F
7	Common gull	<i>Cepora nerissa</i>	15	RS
8	Common wanderer	<i>Pareronia hippia</i>	1	RS
9	West Virginia white	<i>Pieris virginiensis</i>	5	AG
10	One-spot grass yellow	<i>Eurema andersonii</i>	5	GR
11	Striped albatross	<i>Appias libythea</i>	2	OS
S. No.	Common name	Scientific name	Abundance	Location
Family – Lycaenidae (11)				
1	Tailless lineblue	<i>Prosotas dubiosa</i>	2	OS
2	Asian zebra blue	<i>Leptotes plinius</i>	10	OS
3	Red pierrot	<i>Talicada nyseus</i>	2	OS
4	Forget me not	<i>Catochrysops strabo</i>	1	GR
5	Club Silverline	<i>Spindasis syama</i>	5	AG
6	Common pierrot	<i>Castalius rosimon</i>	2	OS
7	Striped Pierrot	<i>Tarucus nara</i>	1	GR
8	Bright babul blue	<i>Azanus ubaldus</i>	3	GR
9	Dark grass blue	<i>Zizeeria karsandra</i>	4	OS
10	Lime blue	<i>Chilades lajus</i>	2	GR
11	Plane cupid	<i>Luthrodes pandava</i>	4	OS
Family – Hersperiidae (2)				
1	Common banded awl	<i>Hasora chromus</i>	4	F
2	Conjoined swift	<i>Pelopidas conjuncta</i>	2	G

G= Garden, RS= Road side, GR= Grass, OS= Open scrub, F= Forest, AG= Agriculture

## CONCLUSION

Our results indicate diversity and abundance of butterflies especially Nymphalidae, Pieridae, Lycaenidae species. Enhancement of butterflies as ecosystem conservation should be considered by the local people. Conservation of natural habitat as well as marginal areas is essential. This could be done by reduced grazing in

grasslands, providing nesting sites improving nectar availability for butterflies. We should see that no species become extinct due to human causes.

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