

Diversity of Butterflies in Shivaji University Campus, Kolhapur.

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Abstract: *The present study was conducted on the butterfly diversity of the Shivaji University Campus, Kolhapur, located in Western Maharashtra. The campus lies at 16°40' N latitude and 74°15' E longitude at an altitude of 587.6 meters above mean sea level and covers an area of approximately 853 acres. The campus consists of diverse habitats such as grassland, woodland, gardens, wetlands, and open land, which support a variety of flora and fauna.*

During the study, a total of 19 butterfly species belonging to 5 families, 9 subfamilies, 14 tribes, and 17 genera were recorded. Among these, the family Nymphalidae was the most dominant with 8 species, followed by Pieridae with 6 species. The families Lycaenidae and Papilionidae each contributed 2 species, while Hesperidae was represented by a single species. The study highlights the diversity of butterflies present in the Shivaji University campus and emphasizes the ecological importance of maintaining habitat diversity for the conservation of butterfly species.

Keywords: Butterfly diversity, Conservation, Biodiversity, Shivaji University

I. INTRODUCTION

The butterfly fauna of India is very rich and diverse. The number of Indian butterflies amount to one fifth of the world total of butterfly species. The mountain range of Himalayas houses most of the Indian butterfly diversity (Haribal, 1992), while the Northeast India harbours of around 64% of total Indian butterflies (Evans, 1932). However, the butterflies of the Northeast India include many climax forest species. The climax forest species are known to have smaller geographical ranges and hence, higher conservation values (Leps and Spitzer, 1990).

Among the insects, Lepidopterans (moths and butterflies) are one of the most specious groups of organisms on Earth; the biological characteristics instrumental in the success of this group are complex and interrelated. The described, world fauna of Lepidoptera is more than 1,40,000 species, and if projections are correct, the total may be as high as 280,000-1,400,000 species for the world." Heppner (1991) listed "total described" as 146,277 and "estimated totals" as 255,000.

There are about 17,500 species of butterflies in the world. Butterflies are currently, with some arguments, placed into the following six families: Hesperidae, known as "Skippers," containing relatively small, fast-flying species. About 3,000 worldwide species. Lycaenidae, "Blues, Hairstreaks and Coppers". Over 5,000 world species. Nymphalidae, known as "Brush-footed" butterflies, contains many subfamilies. There are some 5,000 worldwide species. Papilionidae. Known as "Swallowtail butterflies", most species have prominent "tails." Some 600 species in the world. Pieridae, known as "Yellows and Whites, More than 1,000 worldwide species. Riodinidae, known as "metalmarks", are sometimes placed in the Family Lycaenidae. About 1,000 species in the world. (<https://www.si.edu/spotlight/buginfo/butterfly>).

The butterfly develops through a process called metamorphosis that is they show complete metamorphosis. There are four stages in the life cycle of butterflies' egg, larva, pupa, and adult.

Eggs are laid on host plants by the adult female butterfly. These plants will then become the food for the hatched caterpillars. Eggs can be laid in spring, summer or fall. This depends on the species of butterfly. Females lay eggs singly or in masses.



Larva is the second stage of life cycle. Butterfly larvae are also called a caterpillar. The job of the caterpillar is only eating. As the caterpillar grows it splits its skin and sheds it about 5 to 7 times. Food eaten during larval stage is stored and used later during pupation. Caterpillars can grow 100 times their size during this stage.

When the caterpillar is full grown and stops eating, it becomes a pupa. The pupa of butterflies is also called a chrysalis. Depending on the species, the pupa may suspend under a branch, hidden in leaves or buried underground. Some species have a pupal stage that lasts for two years. It may look like nothing is going on but big changes are happening inside. Special cells that were present in the larva are now growing rapidly. They will become the legs, wings, eyes and other parts of the adult butterfly. Many of the original larva cells will provide energy for these growing adult cells.

Adults look very different from the larva. They have long legs, long antennae, and compound eyes. They can also fly by using their large and colorful wings. The adult's job is to mate and lay eggs. Some species of adult butterflies get energy by feeding on nectar from flowers but many species don't feed at all. The adult female can easily fly from place to place to find the right plant for its eggs. Most adult butterflies live only one or two weeks, but some species hibernate during the winter and may live several months. (<https://ansp.org/exhibits/online-exhibits/butterflies/lifecycle>).

II. MATERIAL AND METHODS

Study Region:

Specimens were collected from the Shivaji University Campus, Kolhapur.

Kolhapur district from Western Maharashtra is rich in flora and fauna. Shivaji University is located at 16° 40' N latitude and 74° 15' E longitudes on the southern side of the Kolhapur city at the altitude of 587.6 MSL. The University campus covers about 853 acres of area. Earlier, this hilly area of the city was used for farming.

The University campus is broadly classified into different sectors depending on diverse habitats on the campus like grassland, woodland, gardens, wetlands, and open land. The large part is covered with 325 acres of grassland. The second-largest habitat is the Woodland habitat, 280 acres, Garden 30 acres, wetland 68 acres, and Open land, 150 Acres respectively.

Sampling:

Sampling of Butterflies was done by sweeping net from study region i.e. Shivaji University campus. Sampling was carried out from April to June 2022. Plastic containers are used for sampling. The sampled specimens were killed by using chloroform. Killed Butterfly specimens were pinned by using entomological pins of different size depending on size of specimens. After pinning the specimens were spread on spreading board. After spreading of specimens the spreading board was kept in drying chamber for drying. specimens were labeled with details including scientific name, location, collector, date and source.

Photography: Photographs were made by using Redmi power 9 photo camera.

Preservation: Insects boxes made up of wooden material was used to store specimens. Naphthalene balls were kept as repellent for pest also prevents growth of fungus and was replaced periodically as they are volatile.

Identification: Identification of species was done by following the literature of Bhakare and Ogale (2018).

III. RESULT

During the course of sampling of butterflies, 19 species belonging to 5 families, 9 subfamilies, 14 tribes and 17 genera were recorded from Shivaji University Campus, Kolhapur. Out of 19 Species 1 belong to family Hesperidae, 2 species belong to family Lycaenidae, 8 to Nymphalidae, 6 to Pieridae and 2 to Papilionidae.

Family Nymphalidae dominates with 8 species. Followed by family Pieridae contain 6 species then family Lycaenidae and Papilionidae contain 2 species respectively and family Hesperidae with only 1 species.



Table: butterflies recorded in present work

SR. NO.	FAMILY	COMMON NAME	SCIENTIFIC NAME	NO. OF INDIVIDUALS
1.	Nymphalidae	1. Blue tiger	<i>Tirumala limniace</i>	4
		2. Tawny coster	<i>Aceraea terpsicore</i>	2
		3. Striped tiger	<i>Danus genutia</i>	1
		4. Plain tiger	<i>Danus chrysippus</i>	3
		5. Lemon pansy	<i>Junonia lemonias</i>	3
		6. Common crow	<i>Euploea core</i>	1
		7. Danied egg fly	<i>Hypolimnas misippus</i>	1
		8. Common evening brown	<i>Melanitis leda</i>	1
2.	Pieridae	9. Common jezebel	<i>Delias eucharis</i>	1
		10. Mottled emigrant	<i>catopsilia pyranthe</i>	1
		11. Common emigrant	<i>Catopsilia pomona</i>	5
		12. Psyche	<i>Laptosia nina</i>	1
		13. Spotless grass yellow	<i>Eurema laeta</i>	2
		14. Three spotted grass yellow	<i>Eurema blanda</i>	3
3.	Lycaenidae	15. Plain cupid	<i>Chilades pandava</i>	1
		16. Pea blue	<i>Lampides bouticus</i>	1
4.	Papilionidae	17. Common jay	<i>Graphium doson</i>	1
		18. Common mormone	<i>Papilio polytes</i>	1
5.	Hesperiidae	19. Canara swift	<i>Caltores Canariaca</i>	1

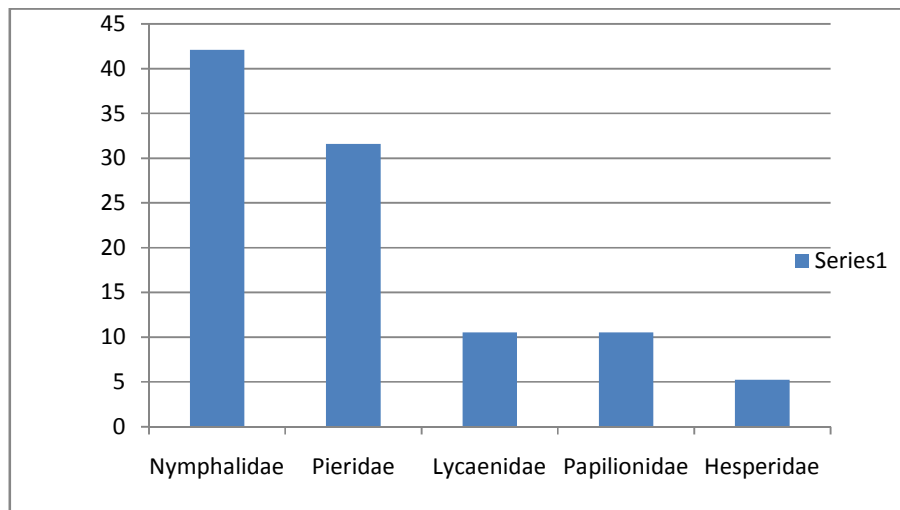


Fig.1 Number of the species of butterfly in a family wise composition in the study area.



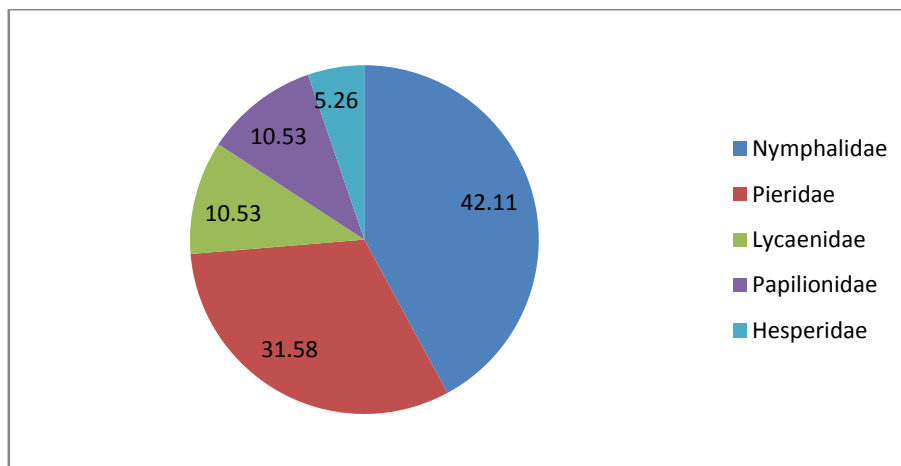


Fig.2 Family wise percentage composition of the species of butterfly in the study area

Fig.3 Recorded Butterfly Specimens



Fig.1 *Caltoris Canariaca*



Fig.2 *Chilades pandava*



Fig.3 *Lampides bouticus*



Fig.4 *Tirumala limniace*





Fig.5 *Acraea psicle*



Fig.6 *Danus genutia*



Fig.7 *Danus chrysippus*



Fig.8 *Junonia lemonias*



Fig.9 *Euploea core*



Fig.10 *Hypolimnas misippus*





Fig.11 *Melanitis leda*



Fig.12 *Delias eucharis*



Fig.13 *Catopsilia pyranthe*



Fig.14 *Catopsilia pomona*



Fig.15 *Laptosia nina*

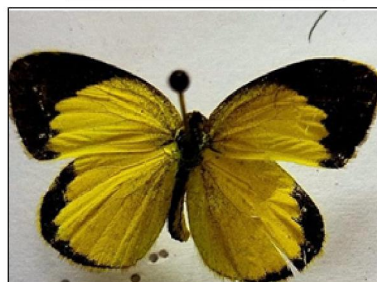


Fig.16 *Eurema laeta*



Fig.17 *Graphium doson*



Fig.18 *Papilio polytes*



IV. CONCLUSION

From the above study we conclude that Family Nymphalidae dominates with 8 species. Followed by family Pieridae contain 6 species then family Lycaenidae and Papilionidae contain 2 species respectively and family Hesperidae with only 1 species. Family Nymphalidae and Pieridae was observed abundant in number as compared to other Families. Increased number of butterflies from Nymphalidae and Pieridae was due to favorable environmental condition and availability of host plants and nectar plants.

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