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Butterfly Diversity of Veerappampalayam Area at Idappadi in Salem District, Tamilnadu, India

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Article History	Abstract
	A study of butterfly diversity was carried out at Veerappam palayam village, Idappadi Taluk, in Salem District, Tamilnadu, India. The study was carried out from June 2022 to November 2022 except for the rainy seasons. A number of 21 butterfly species that belong to 5 families were recorded through visual observations of their wing patterns, colour and also referring to field guides. The butterflies belonging to five families, Nymphalidae (38%), Papilionidae (24%),Lycaenidae (19%), Pieridae (14%) and Hesperiidae (5%) were observed. The butterfly diversity was observed areas from Veerappam palayam Melvalu, Paal sosite and Karattukatu. The area has cultivated more lands in village side and which serve as host plant for laying the eggs and plants for nectar. The most of the butterflies are sitting plants as Tephrosia Purpurea, Euphorbia hirta, Pueraria phaseoloides, Stachytarpheta indica, Lantana camara, Tagetus, Cosmos and several species of grasses.
	Keywords: *Butterfly diversity, Visual observations, Species. Idappadi.*

1. Introduction

Butterflies are the most beautiful, colourful, very good pollinators as well as they play a role as predators, pests and weed killers. Butterflies belong to the phylum Arthropoda, coming under class Insecta and the order Lepidoptera. The order Lepodoptera is divided into two suborders as Heterocera (Moths) and Rhopalacera (Butterflies). Butterflies are classified into two superfamilies *viz.,* Hesperioidea and Papilionoidea. Hesperioidea consists of a single family of Hesperiidae (Skippers), whereas Papilionoidea consists rest of the butterfly families *viz.,* Papilionidae (Swallowtails), Pieridae (Whites and Sulphurs), Nymphalidae (Brush-footed butterflies) and Lycaenidae (Blues). So far, about 1,57,424 species of Lepodoptera have been described globally [8]. There are about 18,000 species of butterflies in the world and India has 1,501 species of butterflies [6]. The book "Identification of Indian butterflies," was published by Evans [3] provides notes to identify Indian butterflies up to family and species level. [4] Later published a book "Some South Indian Butterflies" with description and photographs for 139 butterflies. They are commonly mentioned as "insects of the sun" because of their eye-catching color and delicate charisma [5]. Butterflies are good biological indicators of habitat quality and also general environmental health [11][7][20]. Butterflies accomplish pollination, a key stone ecological process in natural sustainability throughout the planet. As both adults and larvae depend on vegetation for development, they involve themselves in complex feeding relationships with green plants. Butterflies prove to be the best rapid indicators of habit quality and they are also considered as the sensitive indicators of climatic change [22]. Insects' biodiversity is decreasing at a speedy rate, butterflies are at the frontline of decline, and the most common causes of species decline are habitat loss, degradation, and frag-mentation [17][19][2]. Thus, studding butterflies' diversity in different land use types with an aim of understanding their diversity, ecology, and impact of their declining on land use type and biodiversity conservation is very important for their conservation strategies [21].

2. Materials And Methods

Study area

Present study on Butterfly diversity was carried out at Veerappam palayam village, Idappadi Taluk, in Salem District, Tamilnadu, India. The geographical location of this study area is 11.573946°N and 77.856341°S. This study areas were observed from three sites of Veerappam palayam Melvalavu, Paal sosite and Karattukatu.

Fig-1 Study area

Sampling

A weekly random survey on butterfly diversity was carried out June 2022 to November 2022. The study was carried out either from 8:00 AM to 11 AM or 3:00 PM to 5:00 PM. Every habitat in and around of this area was covered by random observations as well as opportunistic sampling during walking through the road's village path, agricultural lands, residential vegetation etc. Butterflies were observed, captured, photographed, identified and released immediately at the spot of capture. The photographs were taken by using mobile phone, vivo 2141. In difficult cases the specimen was collected using an aerial sweep net and transferred to plastic bottle and brought back to the home for detailed identification.

Identification

Butterflies were primarily identified directly in the field and photo documented. Species identity was done with the assistance of the field guides [9][6]. Taxonomy and nomenclature that was very useful for identification [10]. The standard "Pollard walk"[15] method was used for field survey. Transects of approximately 1000 metres in length, divided into five segments of 200 metre. Each transect was observed twice, and the number of individuals per species from all five segments were recorded. The butterflies were spotted within 2.5 metres of the left and right sides, as well as five metres in front of the observer.

Data analysis

The butterflies observed in each survey were identified upto species level and tabulated. The occurrence status was decided on number of encounters of species in the study sites: rare (R) - 1 to 2 sightings; Occasional (O) - 5 to 9 sightings; Common (C) -11 to 16 sightings in the study area. The Shannon-Wiener diversity index was used to calculate relative abundance. Simpson's Index was used to calculate the diversity indices. The evenness of the species was calculated using the Evenness Index E= H/lnS, where H is the diversity index. lnS denotes the total number of species. Species richness was also calculated, which represents the number of species per sample as a measure of richness [13] Table-3.

3. Results and Discussion

The results of the present study, a total of 21 butterfly species belonging to 5 families were recorded through visual observations of their wing color, patterns and also referring to field guides. Family wise diversity of butterfly was dominated by Nymphalidae (38%) followed by Papilionidae (24%), Lycaenidae (19%) Pieridae (14%), and Hesperioidea (5), (Fig 2). The number of butterfly species recorded in five different families is shown in Table 1. The maximum numbers of butterfly species were observed in Nymphalidae family. The minimum number of butterfly species found in Papilionidae, Lycaenidae, Pieridae and few number of butterfly species observed from Hesperioidea family. The

presence and absence of butterflies were also recorded as Common (C), Occasional (O), Rare (R), and Very Rare (VR). Figure 4 shows the total number of butterflies were collected monthly; it measures that provides a better understanding of the temporal changes in the butterfly abundance in the study area. The highest butterfly species was observed in the month of July. This could be due to the effect of temperature, rainfall, and humidity. The most of the butterflies are sitting plants as *Tephrosia Purpurea, Euphorbia hirta, Pueraria phaseoloides, Stachytarpheta indica, Lantana camara*, Tagetus, Cosmos and several species of grasses. Butterfly species diversity indices such as Shannon's Weiner Index, Simpson Index of Diversity, Species Richness, and Evenness were computed by month wise from June to November (Fig-3). The month of July had the most diversity, while the month of November had the least, with only a few species seen.

Table 1: Butterfly species observed in Idappadi from June 2022 – November 2022

S.No	Scientific name	Common name	Family	Occurrence
1	*Orsotriaena medus*	Nigger	Nymphalidae	C
2	*Melanitis leda*	Common evening brown	Nymphalidae	C
3	*Junonia iphita*	Chocolate pansy	Nymphalidae	C
4	*Tirumala limniace*	Blue tiger	Nymphalidae	O
5	*Hypolimnas bolina*	Great Egg Fly	Nymphalidae	C
6	*Junonia lemonias*	Lemon Pansy	Nymphalidae	C
7	*Parantica aglea*	Glassy Tiger	Nymphalidae	O
8	*Tirumala septentrionis*	Dark Blue Tiger	Nymphalidae	C
9	*Jamides celeno*	common cerulean	Lycaenidae	C
10	*Castalius rosimon*	Common Pierrot	Lycaenidae	C
11	*Zizeeria karsandra*	Dark grass blue	Lycaenidae	C
12	*Deudorix isocrates*	Guava Blue	Lycaenidae	C
13	*Eurema hecabe*	Common grass yellow	Pieridae	C
14	*Eurema laeta*	Spotless grass yellow	Pieridae	R
15	*Leptosia nina*	Psyche	Pieridae	R
16	*Oriens goloides*	Smaller Dartlet	Hesperiidae	C
17	*Graphium agamemnon*	Tailed Jay	Papilionidae	**C**
18	*Pachliopta hector*	Crimson Rose	Papilionidae	C
19	*Papilio demoleus*	Common Lime	Papilionidae	C
20	*Catopsilia pomona*	Lemon Emigrant	Papilionidae	C
21	*Eurema blanda*	Three Spot Grass Yellow	Papilionidae	C

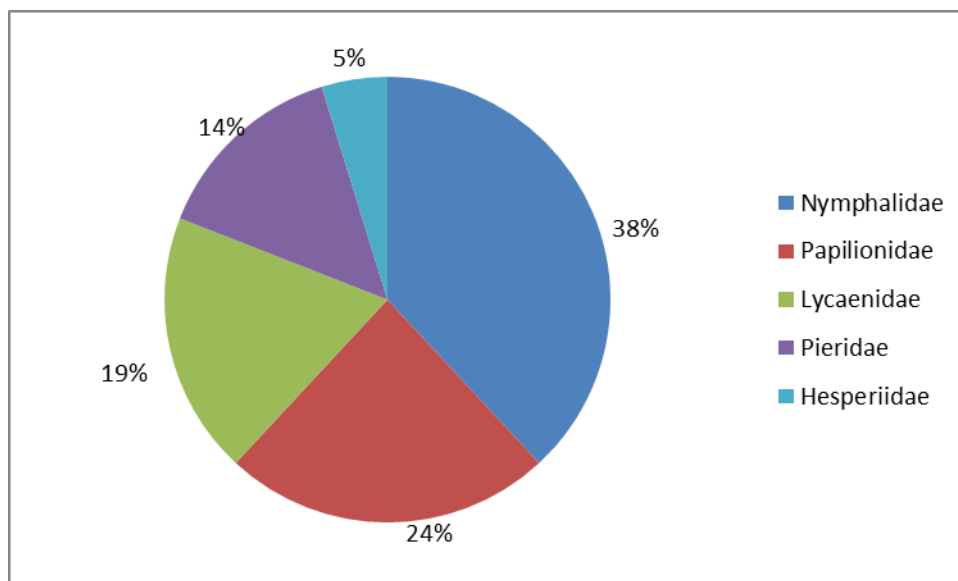**Fig:2** Percentage of Butterfly species diversity composition across families

Table 3: Diversity Indices of Butterfly Species Recorded in the study site

Month	Abundance	P_i	P_i^2	$P_i\ln[P_i]$		Measure	Value
June	22	0.075	0.006	-00.194		**S**	6
July	26	0.089	0.008	-00.215		**D**	00.2
August	43	00.147	0.022	-00.282		**H**	1.692
September	52	00.178	0.032	-00.307		**E**	00.944
October	66	00.225	0.051	-00.336			
November	84	00.287	0.082	-00.358			
Total	293	1					

S- Species Richness, Simpson's Index – D, Shannon – Weiner Index – H, E- Evenness

Fig3. Percentage of Butterfly species composition across families
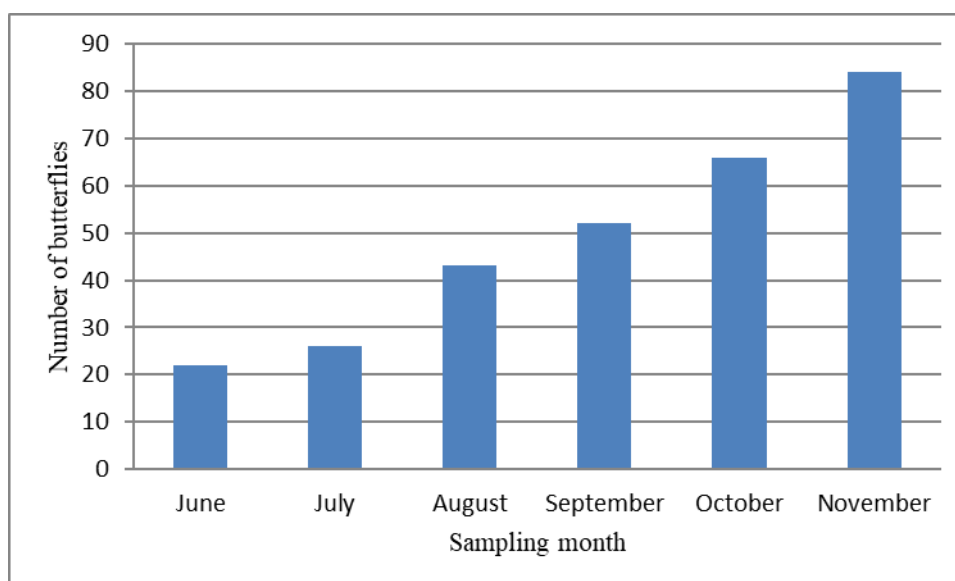
The diversity and composition of the community are dependent on the diversity and composition of the plants, as their caterpillars are strictly dependent on specific host plants. Because of their dual fundamental role, they contribute more to local diversity as they metamorphose than monomorphic organisms. Butterflies are common for only a few months of the year and rare or absent the rest of the year [22]. In the present work data is used to analyse role of butterfly diversity at selected sites. Butterflies are considered as indicators of ecosystem change and are used to predict various environmental alterations [1][16]. Now a day's increased pollution by humoral activity and any few changes in the environmental that reflect through lower organism. [12] The study reported that the most diverse species of butterfly in the study area were belonging to Nymphalidae family with (31) species followed by Hesperidae (12), Pieridae (19) and Lycaenidae (16) respectively. The documented 22 butterfly species were reported from theerthamalai area [18]. In the present study of butterfly diversity was observed 21 species of butterflies were recorded under five family's wise diversity of butterfly was dominated by Nymphalidae (38%) followed by Papilionidae (24%), Lycaenidae (19%) Pieridae (14%), and Hesperioidea (5), (Fig 2). The study area's diversity indices were calculated on a monthly basis. Each month, the abundance, richness, and evenness were varied. The highest abundance was recorded in November (139) followed by October (73), December (39) and lowest recorded in January (22). The present study diversity indices like Shannon's Weiner Index were calculated and it ranges between 0.0336 to 0.358, similarly Simpson Diversity showed a variation between 0.225 to 0.287 Species richness and evenness also showed little variation. In a short period of our study recorded a difference in the diversity.

4. Conclusion

According to the finding of this study, diversity of butterfly was dominated by Nymphalidae followed by Papilionidae,Lycaenidae,Pieridae and Hesperioidea. It is a preliminary study and a lot of research is necessary in this regard and further collections are essential for getting a detailed record of the butterfly diversity. Planting of endemic trees and plants supporting the local wildlife will help to protect at least

the common species from not going on to the verge of extinction. In addition, further research will be needed for documentation of butterfly species which will help in future conservation of butterflies in the area.

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Conflict of interest: The authors declared that they have no conflict of interest.

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