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# A Preliminary Study of the Butterfly Fauna in Selected Areas of Thrissur Dt. Kerala with Emphasis on Pattikkadu Region, Peechi

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***Abstract:*** ***In this study, all common families, Nymphalidae(16 species), being most dominant followed by Papilionidae (7 species), Pieridae(5 species), Hespiridae (4 species), and Lycaenidae(3 species) were represented. Thirty-five species were sighted in the study areas. Family Nymphalidae was most dominant. Species richness study was done only in the Pattikkadu region and did not show many fluctuations. There were a total of 433 sightings of ten species. Species abundance showed slight fluctuations across the months. Maximum sightings were of Leptosia nina. Factors such as habitat and month of observation did not seem to have a marked difference in the distribution and abundance of the butterfly species.Each species of butterfly has its own set of clearly defined preference concerning the environment in which it lives,this was reflected in beta diversity values, which showed similarity(86%)between Peramangalam and Parappur which had similar habitats and Peechi and Pattikkadu which lay near and had similar geography and flora. Observation of biodiversity in inhabited areas will help in better understanding of biodiversity values.***

***Keywords; butterfly, diversity, species richness***

## I. INTRODUCTION

Butterflies are the most fascinating groups of insects belonging to the order Lepidoptera.they are among the most colorful and easily recognizable animals of the counters for centuries.studies in butterflies of Kerala stated back in the middle of the18th century.in Lepidoptera, about 13,000 species of butterflies have been identified from India of 150 species of western ghats which include 37 endemics and another 23 shared with Srilanka. Butterflies are instantly familiar and universally popular. their popularity is largely due to their appearance, especially their glorious colors .they can be distinguished from all other insects in having their delicate wings covered with scales.they are also dominant components of all forms of webs.being so diverse and ecologically important, they are first to be attacked by any difference in their habitats.butterflies are particularly valuable in monitoring ecological changes and serve to warn us of deteriorating environment.they is one among the most efficient pollinators of the flower. many species of butterflies are ornamental and are commercially important as articles of decoration.

### *A. Life History of Butterflies*

There are four stages in the metamorphosis of butterflies and moths: egg, larva, pupa, and adult.

1) *Egg:* Eggs are laid on plants by the adult female butterfly. These plants will then become the food for the hatching caterpillars. Eggs can be laid from spring, summer, or fall. This depends on the species of butterfly. Females lay a lot of eggs at once so that at least some of them survive. Butterfly eggs can be very small.
2) *Caterpillar:* The Feeding Stage. The next stage is the larva. This is also called a caterpillar if the insect is a butterfly or a moth. The job of the caterpillar is to eat and eat and eat. As the caterpillar grows it splits its skin and sheds it about 4 or 5 times. Food eaten at this time is stored and used later as an adult. Caterpillars can grow 100 times their size during this stage. For example, a monarch butterfly egg is the size of a pinhead and the caterpillar that hatches from this tiny egg isn't much bigger. But it will grow up to 2 inches long in several weeks.
3) *Pupa:* The Transition 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 be suspended under a branch, hidden in leaves, or buried underground. The pupa of many moths is protected inside a cocoon of silk.This stage can last from a few weeks, a month, or even longer. 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.

4) *Adult:* The Reproductive Stage.The adult stage is what most people think of when they think of butterflies. They look very different from the larva. The caterpillar has a few tiny eyes, stubby legs, and very short antennae. The adults have long legs, long antennae, and compound eyes. They can also fly by using their large and colorful wings. The one thing they can't do is grow.The caterpillar's job was to eat. 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.Flying comes in handy. The adult female can easily fly from place to place to find the right plant for its eggs. This is important because caterpillars can't travel far.Most adult butterflies live only one or two weeks, but some species hibernate during the winter and may live for several months.

## II. OBJECTIVES

To compile a checklist of the butterflies in the study area
To study the species diversity and abundance of butterflies in the study area
To compare the diversities of butterflies in different habitats of the study area

## III. METHODOLOGY

Four areas of Thrissur district were selected. Each of the areas showed different vegetation type. The areas were:

1) *Pattikkdu Region:* Almost 90% of the study area consists of homesteads, shops, and business establishments. the remaining areas are rubber plantations, forest department land, paddy fields, and roads. The maximum temperature is experienced in march and April. Maximum rain fall is from southwest monsoons. The months of January and February consists of dry winds. One pond associated with the temple and Peechi dam fed canal is present in the study area
2) *Peechi:* The terrain is hilly. Almost 60%of the study area consists of forest and mixed cultivation. Houses are also present. The maximum temperature is experienced in March and April. Maximum rain fall is from SouthWest monsoons. The months of January and February consists of dry winds. The main water body is the Peechi dam reservoir and its canals
3) Mylattumpara: the terrain is hilly. almost 75%of the study area consists of forest and mixed cultivation.houses are also present. The maximum temperature is experienced in march and April and maximum rain fall is from SouthWest monsoons. The months of January and February consists of dry winds. The main water body is the Peechi dam reservoir and the Manali river.
4) *Peramangalam:* Characterised mainly by plain terrain made up of paddy fields, flanked by the hill, scared groove human habitations.other cultivation include coconut and plantain. The maximum temperature is experienced in March and April. Maximum rainfall is from SouthWestern monsoons. Water bodies include a perennial pond near the paddy field.
5) *Parappur:* characterized by plain terrain made up of paddy fields and coconut plantation. The maximum temperature is experienced in March and April. Maximum rainfall is from South Western monsoons. Water bodies include a stream called Chorotha that flows towards Chettuva.

### *A. Data collection*

For compiling checklist butterflies were observed at all times .For abundance and diversity month-wise observation was done and it only done in Pattikkadu. Butterflies were observed in day time for four months from August 2012 to November 2012 and identification up to species level was done.The data tabulated and sorted in ms excel.based on abundance butterflies are classified into rare, occasional, common, or frequent. the maximum number of sightings were divided into four quartiles.Relative abundance was calculated by the formula

Relative abundance=abundance of ith species/total abundance*100

Diversity calculated is beta diversity by the formula of Jaccard index

$C_{j=}j/(a+b-j)$

Where j is the number of species recorded in both sites

A is the number of species recorded in site A

B is the number of species recorded in site A

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## IV. RESULTS AND DISCUSSION

Table 1 checklist of butterflies observed in the study area Pattikkadu region from august 2012 to November 2012.

| No | family | Scientific name | Common name | Category |
|---|---|---|---|---|
| 1 | Pieridae | *Eurema hecabe* | Common Grass Yellow | Occasional |
| 2 | Pieridae | *Leptosia nina* | Psyche | Frequent |
| 3 | Pieridae | *Captopsilia pomana* | Common Emigrant | Occasional |
| 4 | Nymphalidae | *Euploea core* | Common Indian Crow | Occasional |
| 5 | Nymphalidae | *Hypolimmas bolina* | Great Eggly | Rare |
| 6 | Nymphalidae | *Orsotrionea medos* | Nigger | Rare |
| 7 | Papilionidae | *Graphium Agamemnon* | Tailed Jay | Rare |
| 8 | Papilionidae | *Papilio polymnester* | Blue Mormon | Rare |
| 9 | Papilionidae | *Papilio polytes* | Common Mormon | Rare |
| 10 | Papilionidae | *Triodes minos* | Southern Bird Wing | Rare |

Categorization of species
Upper range =147,lower range =0,ist quartile =36.75,2$^{nd}$ =73.50,3$^{rd}$ =110.25
Species having a frequency less than 37 were categorized as rare
Species having a frequency above 37 and below 74 were categorized as occasional
Species having a frequency above 74 and below 110 were categorized as common
Species having a frequency above 74 and below 110 were categorized as common
And species having a frequency above 110 as frequent

Table2.Checklist of butterfly species in Peechi and Mayilattupara from August to November 2012

| No | family | Scientific name | Common name |
|---|---|---|---|
| 1 | Pieridae | *Delias eucharias* | Common Jezbel |
| 2 | Pieridae | *Catopsila pomana* | Common Emigrant |
| 3 | Pieridae | *Eurema hecabe* | Common Grass Yellow |
| 4 | Pieridae | *Leptosia nina* | Psyche |
| 5 | Nymphalidae | *Junonia almama* | Peacock Pancy |
| 6 | Nymphalidae | *Euploea core* | Common Crow |
| 7 | Nymphalidae | *Parantica aglea* | Glassy Tiger |
| 8 | Nymphalidae | *Tirumala limniace* | Light Blue Tiger |
| 9 | Nymphalidae | *Junonia lemonia* | Lemon Pancy |
| 10 | Nymphalidae | *Hypolimnas misippus* | Danaid Eggfly |
| 11 | Nymphalidae | *Ypthima baldus* | Common Five Ring |
| 12 | Nymphalidae | *Mycalesis perenus* | Common Bush Brown |
| 13 | Nymphalidae | *Moduza procris* | Commander |
| 14 | Papilionidae | *Triodes minos* | Southern Bird Wing |
| 15 | Papilionidae | *Papilio polmnstor* | Blue Mornon |
| 16 | Papilionidae | *Papilio helenus* | Red Helen |
| 17 | Papilionidae | *Pantoporia hordonia* | Common Rose |
| 18 | Lycaenidae | *Talicada nyseus* | Red Pierrot |

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Table3. Check list of butterflies from Peramangalam from August to November 2012

| No | Family | Scientific name | Common name |
|---|---|---|---|
| 1 | Pieridae | Leptosia nina | Psyche |
| 2 | Pieridae | Appias albino | Common Albatross |
| 3 | Pieridae | Eurema hecabe | Common Grass Yellow |
| 4 | Nymphalidae | Euploea core | Common Indian Crow |
| 5 | Nymphalidae | Parantica aglea | Glassy Tiger |
| 6 | Nymphalidae | Junonia atlites | Grey Pancy |
| 7 | Nymphalidae | Junonia iphita | Chocolate Pancy |
| 8 | Nymphalidae | Melanitis leda | Evening Brown |
| 9 | Nymphalidae | Elymnias hypermnestra | Common Palmplay |
| 10 | Papilionidae | Graphium eurypylus | Great Jay |
| 11 | Hespiridae | Iambrix salsala | Chesnut Bob |
| 12 | Lycaenidae | Jamides sps | |

Table 4 :Checklist of butterflies observed from study area Parappur from august 2012 to November 2012

| no | Family | Scientific name | Common name |
|---|---|---|---|
| 1 | Pieridae | Eurema hecabe | Common Grass Yellow |
| 2 | Pieridae | Leptosia nina | Psyche |
| 3 | Pieridae | Captopsilia pomana | Common Emigrant |
| 4 | Nymphalidae | Euploea core | Common Indian Crow |
| 5 | Nymphalidae | Junonia iphita | Chocolate Pancy |
| 6 | Nymphalidae | Neptis hylas | Common Sailor |
| 7 | Nymphalidae | Elymnias hypermnestra | Common Palmflay |
| 8 | Papilonidae | Triodes minos | Southern Birdwing |
| 9 | Hespiridae | Suastus gramius | Indian Palm Bob |
| 10 | Hespiridae | Imbrixsalsala | Chesnut Bob |
| 11 | Hespiridae | Thoressa astigmata | Southern Spotted Ace |
| 12 | Hespiridae | Skipper sp 1 | |
| 13 | lycaenidae | Zizula sps | |

Thirty-five species of butterflies were recorded from observation sites of which two could not be identified till species level.All common butterfly species of Kerala recorded with Nymphalidae(16 species) being most dominant followed by Papilionidae(7 species),Pieridae (5 species),Hespiridae(4 species) and Lycaenidae(3species).

Table 5: Species Richness and abundance in Pattikkadu region

| NO | SPECIES | AUG | SEP | OCT | NOV | TOTAL | Relative Abundance |
|---|---|---|---|---|---|---|---|
| 1 | Captosilia pomana | 1 | 3 | 25 | 10 | 39 | 9.01 |
| 2 | Eurema hecabe | 3 | 20 | 25 | 20 | 68 | 15.7 |
| 3 | Graphiumagamemnon | 0 | 1 | 2 | 4 | 7 | 1.62 |
| 4 | Hypolimmas bolina | 0 | 6 | 7 | 9 | 22 | 5.08 |
| 5 | Euploea core | 2 | 20 | 15 | 18 | 55 | 12.7 |
| 6 | Papilio polymnster | 1 | 5 | 8 | 9 | 23 | 5.31 |
| 7 | Leptosia nina | 10 | 50 | 47 | 40 | 147 | 33.95 |
| 8 | Orsotrionea medos | 2 | 5 | 7 | 5 | 19 | 4.39 |
| 9 | Papilio polytes | 1 | 5 | 8 | 9 | 23 | 5.31 |
| 10 | Tridodes minos | 3 | 13 | 10 | 0 | 26 | 6 |
| | TOTAL | 24 | 126 | 153 | 130 | 433 | 100 |

All species were not sighted in all the four-month sampled.only 8 species were sighted in august and trides minos was not sighted in November.

Beta diversity was calculated by the Jaccard index The results are:

Cj=j/(a+b-j)

Betta diversity from Peechi and Pattikkadu=60%===medium similarity

Beta diversity from Peechi and Peramangalam=22%===less similarity

Beta diversity from Peechi and Parrappur=31%===less similarity

Beta diversity from Pattikkadu and Peramangalam===23%===less similarity

Beta diversity from Pattikkadu andParappur=36%===less similarity

Beta diversity from Peramangalam and Parappur =86%===high similarity

## V. DISCUSSION

The distribution of butterflies must be regarded as a changing dynamic state. Most butterflies population change and do not remain constant over many years.In some cases, the numbers may go down for some years perhaps disappearing from some of their old habitats while in some cases numbers starts increasing and spread more widely over a few seasons.

The distribution of species is dependent not only on the geography of the area but also on the ecological demands. each species of butterflies have its own set of clearly defined preferences concerning the environment in which it lives.This was reflected in beta diversity values, which showed high similarity In between peramangalam and Parappur which had similar habitats and Peechi and pattikkad which lay near and had similar geography and flora.in this study all common butterflies with Nymphalidae(16 species) being most dominant followed by Papilionoideae(7 species), Pieridae (5 species),hespiridae(4 species) and Lycaenidae(3species) were represented.due to limitations in the study abundance and diversity only studied in pattikkadu region. The composition does not change across the months indicating an environment suitable for the sighted butterflies.It could also be that most of the butterflies sited were habitat generalists their distribution does not indicate a minute change in the environment.

## VI. CONCLUSION

In this study, all common butterflies with Nymphalidae(16 species) being most dominant followed by Papilionoideae(7 species), Pieridae (5 species),Hespiridae(4 species), and Lycaenidae(3species) were represented. Total of thirty-five species were sighted. Species richness study was done only in the Pattikkadu region and did not show much fluctuation. There were 433 sightings of ten species. The maximum sighting was of *Leptosia nina.* each species of butterflies has its own set of clearly defined preference concerning the environment in which it lives.this was reflected in beta diversity values.

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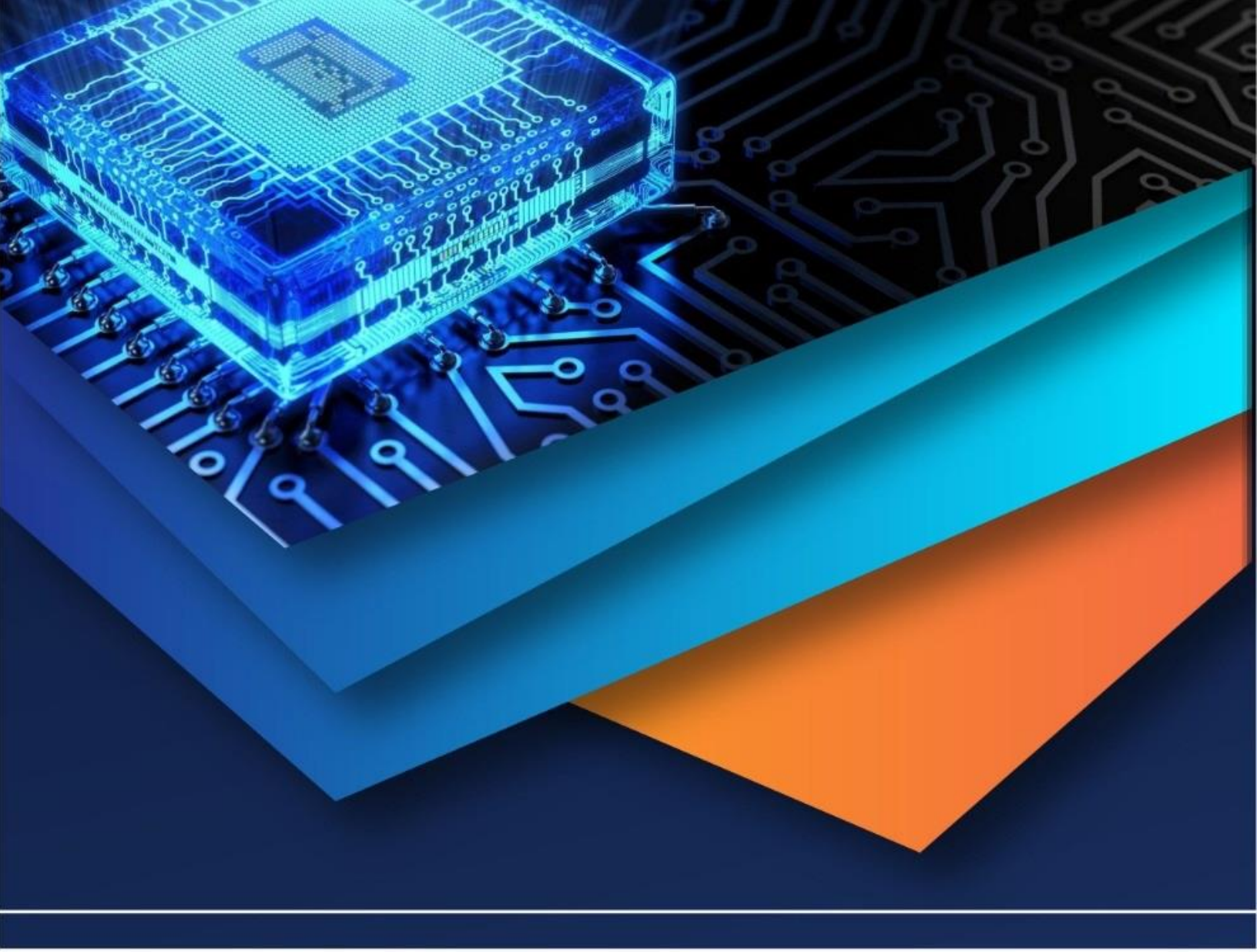

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