



## A PRELIMINARY STUDY OF BUTTERFLY IN TIRUNELVELI, TAMILNADU

L. Jeyaprabha\* & R. Ajaz Haja Mohideen\*\*

\* Zoology Department & Research Centre, Sarah Tucker College (Autonomous),  
Tirunelveli, Tamilnadu

\*\* Department of Zoology, Sadakathullah Appa College (Autonomous),  
Tirunelveli, Tamilnadu

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### Abstract:

The most productive pollinators are butterflies. Pollination is essential to the plants survival, because it is part of their reproductive process. The areas with undisturbed vegetation and high floral diversity support large butterfly communities. In the study area 20 species of butterflies were recorded. Out of the 20 species, twelve belonged to Nymphalidae, three to Pieridae, one to Lycaenidae and four to Papilionidae families. Species belonging to the family Nymphalidae were the most dominant (60 %) followed by Papilionidae (20%), Pieridae (15 %) and Lycaenidae (5% ). Among the 20 butterflies recorded 2 species *Pachlioptahector* and *Hypolimnas misippus* come under schedule I of the Act. The aim of the present study makes an attempt to the diversity of Butterfly in perumalpuram, Tirunelveli, Tamil Nadu, South India.

**Key Words:** Pollinator, Butterflies, Plants Survival & Floral Diversity

### Introduction:

Insects are amongst the most fabulous creations of nature. Insects are extremely important components of the bio indicators of the world.. There are about 1500 species of butterflies in India. Butterflies are one of the most amazing and magnificent elements of bio-diversity. A butterfly is a mainly day-flying insect of the order Lepidoptera, which includes the butterflies and moths.. They are good indicators of a healthy environment and healthy ecosystems because they are sensitive to changes in microclimate, temperature, solar radiation and the availability of host plants for ovi position and larval development. They also are good pollinators (Rosenberg *et al.*, 1986) in the local environment and help to pollinate the economically important crops and are one of the important food chain components of birds, reptiles, spiders and predatory insects.

Out of 1501 species of butterflies recorded from the Indian region so far (Kunte, 2000), 350 species are from Peninsular India, 331 species from the Western Ghats and 313 species of butterflies from South India (Gaonkar, 1996). The butterfly fauna of the southern part of the Peninsular India is very rich and diverse compared to the other parts of the peninsula due to the availability of diverse habitats, a wide range of altitudinal gradients and associated microclimate regimes. The aim of the present study focus an attempt to study the diversity of Butterfly in perumalpuram, Tirunelveli, Tamil Nadu, South India.

### Materials and Methods:

The preliminary study of butterfly was conducted in perumalpuram, Tirunelveli (Elev; 250ft N:8<sup>0</sup> 42.67' E:077<sup>0</sup> 198<sup>3</sup>) from January 2016 to March 2016 when the insect density is high in these study area. The butterflies were collected by various methods such as netting and handpicking Techniques. All butterflies sighted were identified in the field during day time. Some species were collected with the help of sweeping nets and photographed. The adult butterflies were carefully collected, killed, preserved and stored in insect storage boxes, using naphthalene as repellent, to prevent secondary infection to the stored specimens. Identification of butterflies was done using the following literature: Evans (1932), Talbot (1939), Wynter-Blyth (1957), D'Abrera (1982, 1955, 1986), Kunte, (2000), Hussain *et al.*, 2011).

Species diversity was calculated by using the Shannon-Wiener Index.  $H = -(\sum P_i \log P_i)$

Where H= Species diversity index

P= the proportion of individuals in the species

N= Total number of species

i =Species 1, 2, 3.... N.

Evenness index was calculated using  $E1 = H'/\ln(S) = \ln(NI)/\ln(NO)$  Where H' is the Shannon – Weiners' index, NO is the number of all species and NI is the number of abundance species. Evenness of species reveals how their relative abundance is distributed in a particular sample or site (Magurran 1988). Evenness 1 is used here, which expresses the ratio of Hill's number.

### Results:

The butterfly species which were encountered during the study period are listed in Table 1. In the present study species richness and Evenness were given in Table 2. Relative abundance of butterflies was given

in Table 3. The butterflies collected at the time of study period were classified into family according to their presence. Figure 1 explains the status of butterfly species available in each family.

S.No	Name of the Butterfly	Name of the Family
1	<i>Junonia almana</i>	Nymphalidae
2	<i>Acraea violae</i>	Nymphalidae
3	<i>Danaus chrysippus</i>	Nymphalidae
4	<i>Melanitis leda</i>	Nymphalidae
5	<i>Mycalesis oculus</i>	Nymphalidae
6	<i>Catopsilia pomona</i>	Pieridae
7	<i>Pachlioptahector</i>	Papilionidae
8	<i>Cepora nerissa</i>	Pieridae,
9	<i>Hypolimnys misipus</i>	Nymphalidae
10	<i>Junonia lemonias Linnaeus</i>	Nymphalidae
11	<i>Junonia orithya</i>	Nymphalidae
12	<i>Papilio demoleus</i>	Papilionidae
13	<i>Papilio polytes</i>	Papilionidae
14	<i>Tirumala limniace</i>	Nymphalidae
15	<i>Eurema hecabe</i>	Pieridae
16	<i>Euploea core</i>	Nymphalidae
17	<i>Euchrysops cnejus</i>	Lycaenidae
18	<i>Danaus genutia</i>	Nymphalidae
19	<i>Papilio polymnester</i>	Papilionidae
20	<i>Mycalesis perseus</i>	Nymphalidae

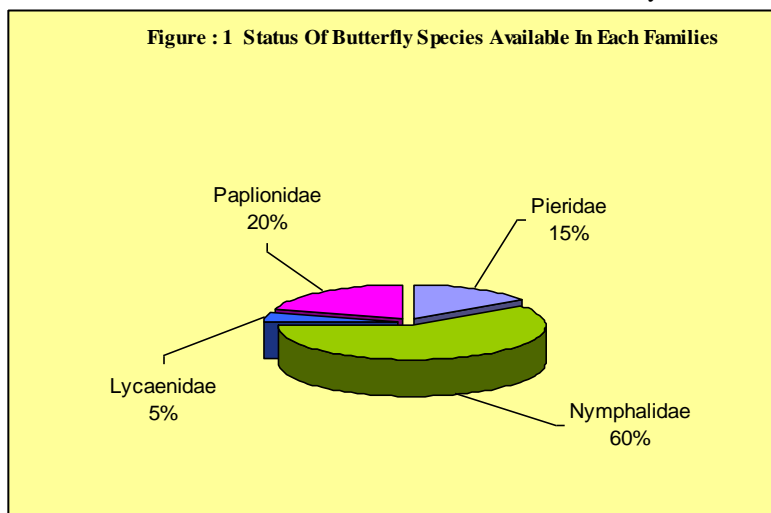
Table 1: Identified butterfly species in study area.

Study Period	Shannon-Wiener index (H-)	Species richness	Evenness (E1)
January		1.32	0.95
February		1.36	0.98
March		1.31	0.94

Table 2: Evaluation of Diversity using Shannon-Wiener index (H-) and Evenness index

S.No	Family	Number of Genera	Relative Abundance (%)	Number of Species	Relative Abundance (%)
1	Pieridae	3	18.75	3	15
2	Nymphalidae	10	62.5	12	60
3	Lycaenidae	1	6.25	1	5
4	Papilionidae	2	12.5	4	20
	Total	16	100	20	100

Table 3: Relative abundance of butterflies in the study area



**Discussion:**

There are number of records of butterflies in various places of India, due to the typical eco-climatic and geographic features, Western Ghats is considered as one of the most diversified areas containing a wide variety of species of butterflies. Earlier various workers like Pandaripande (1990) in his studies listed 61

butterfly species in Nagpur city and 52 species from Amaravati University campus. Subba Reddi *et al.*, (2002) provided a checklist of butterflies of Andhra University and documented 54 butterfly species. Soloman Raju and Purnachandra Rao (2003) recorded 68 butterfly species in Andhra University campus Vishakhapatnam. Hiren soni *et al.*, (2005) provided a preliminary investigations of Butterfly Diversity of Sardar Patel University Campus, Vallabh Vidyanagar, Gujarat.

During the course of the study, 20 species of butterflies belonging to four families were recorded in the study area. Out of the 20 species, twelve belonged to Nymphalidae, three to Pieridae, one to Lycaenidae and four to Papilionidae families. Species belonging to the family Nymphalidae were the most dominant (60 %) followed by Papilionidae (20%), Pieridae (15 %) and Lycaenidae (5%). The greatest number of species observed in February. Some species namely *Danaus chrysippus*, *Acraea violae*, *Catopsilia pomona*, *Euploea core* and *Tirumala limniace* were observed regularly and more commonly. Nearly 50% of species were found very common with frequent sightings and about 30% were found to be abundant while 20% of species were found rare with infrequent sighting. Among the 20 butterflies recorded 2 species come under the protected category of the Indian Wild life (Protection) Act 1972. Among them *Pachlioptahector* and *Hypolimnas misippus* come under schedule I of the Act. Diversity of vegetation may perform a vital role in maintaining local butterfly diversity along with the undisturbed ecological niches in the study area. The distributions of butterflies are exclusively dependent upon the availability of their food plants (Feltwell, 1986). These areas are predominantly covered by thorny shrubs, herbs and trees like *Achras sapota*, *Moringa oleifera*, *Murraya koenigii*, *citrus reticulata*, *Musa paradisiaca*, *Terminalia catappa*, *Carrica papaya*, *Psidium guajava*, *Ficus bengalensis* and *Phyllanthus emblica* etc. A world without pollinators would be a world without apples, blueberries, strawberries, chocolate, almonds, melons, peaches, pumpkins, and many other important food, fiber, and medicinal plants. There is a direct relationship between vegetation diversity and butterfly diversity as butterflies are good pollinators. We need to support pollinators by planting native gardens and plants that attract butterflies.

A previous study (Wynter-Blythe 1957) had identified the months of March –April and October for butterfly abundance in India. However, our findings show a peak period in January and February in line with findings of Kunte, 2000. Our result shows that the study area is supportive to a number of butterfly species and diversity.

Loss of prime habitat is the major threat to all wildlife, including butterflies. Urban development is expected to have a deleterious impact on butterfly populations, because, the construction of buildings and concretes replaces or reduces the area or natural and semi-natural habitats (Tiple and Khurad, 2009). Sudden occurrence of abiotic stress may lead to substantial decline of the butterfly species and thus the change in butterfly diversity can be used as an indicator of environmental degradation (Hussain *et al.*, 2011). The exact status of several species of Indian butterflies is still not clearly known. To initiate a conservation programme for butterfly, one needs first of all, a detailed study of their life histories and the factors governing their survival.

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