A Study on Diversity of Rhopalocera (Butterfly) in and around Gajwel town, Siddipet district, Telangana, India

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ABSTACT

The present study investigates the diversity and abundance of butterfly fauna in Gajwel town, Telangana state, India, conducted over a four-month period. Butterflies were identified in the field its self; in difficult cases by following capture or photography and even by using Aerial insect sweeping nets and hand-picking methods. A total of 30 butterfly species were recorded from different habitats, including parks, gardens, and surrounding areas. These species belonged to four families: Pieridae, Papilionidae, and Lycaenidae. Nymphalidae was the most common family, with 16 species, Pieridae had 8 species, Papilionidae had 5 species, and Lycaenidae had 1 species. Although the majority of the recorded species are categorized under Least Concern, the study highlights the importance of implementing conservation efforts to ensure long-term protection of butterfly diversity. Butterflies, being key pollinators and bioindicators, require continuous monitoring and habitat preservation to maintain ecological balance and biodiversity in the region.

KEYWORDS: Butterfly fauna, Gajwel town, Sweeping nets, Least Concern, Pollinators.

I. INTRODUCTION

Butterflies, which belong to the suborder Rhopalocera and the order Lepidoptera, are one of the most diverse and well-studied groups of insects. Butterflies (suborder Rhopalocera) evolved from nocturnal moth ancestors during the Late Cretaceous, approximately 98–100 million years ago. Their diversification accelerated concurrently with angiosperm evolution, leading to significant families diverging shortly thereafter; for example, Papilionidae separated approximately 110 million years ago, while groups such as Lycaenidae and Riodinidae emerged around 90 million years ago. A present study aims to evaluate the diversity of butterflies from the town of Gajwel. They are important part of ecosystem serving as pollinators and indicator of environmental, their diversity influenced by many factors like habitats, climate, variation, plant interaction. Different Butterfly species have different habitats for mating, breeding, feeding. Butterflies are sensitive to change in their environment including temperature, humidity, light rainfall making them valuable bio indicator. It has sources of host plants and nectar plants, making availability and survival. Diversity influenced as ecological relationship, environment change and conservation efforts.it contains variety of Butterflies species in different habitats across worldwide such as families. The families Nymphalidae, Pieridae, Lycaenidae, Hesperiidae and Papilionidae play important roles in butterfly diversity. Found in wide range of environmental such as forests, grasslands and wetlands, scrublands.

The play important roles in nature as a part of food chain presence of indicate healthy and Balanced ecosystem, it making excellent indicator of biodiversity, it has delicate wings and attractive colourful butterflies and graceful flights. With its varied terrain, climate, and vegetation, the Indian subcontinent is home to about 1,504 butterfly species, out of the approximately 28,000 species found worldwide, most of which are found in tropical regions. Its abundance to ecosystem and environment Tiple (2011). The study promotes the creation of butterfly monitoring platforms for citizen scientists, which will be crucial for enhancing the effectiveness of butterfly conservation efforts Sheng-Quan Fang et al (2024). These delicate creatures play a vital role in pollination, serve as food sources for various animals, and are indicator of ecosystem health. with unique geography and climatic is a home to rich array to butterflies and moth's species. However, their diversity, distribution, and abundance remain poorly understood and maintained balance of ecosystem.

II. MATERIALS AND METHODS

Study area:

The study area is Gajwel, officially Gajwel–Pragnapur, is a town and a Municipality in Siddipet district of the Telangana state, India. Latitude and longitude coordinates area of Gajwel are 17.8512°N and 78.5902°E. The major habitats of the Gajwel includes butterflies' diversity in Kalpakavanam Forest Park, Herbal Park, Mini Tank Bund, Agricultural fields. The data were collected for the period of four months from April 2025 to July 2025.

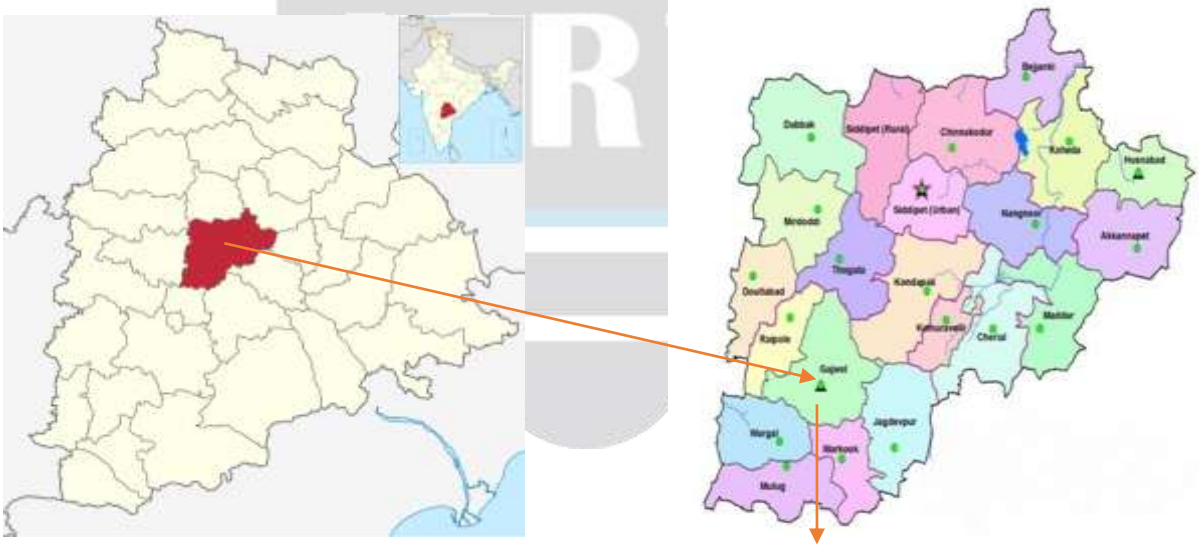

Fig 1: Map of Gajwel town in Siddipet district, Telangana State, India

Methods:

The fieldwork for this study was conducted random surveys in and around the areas of Gajwel town. The work was carried out during April, 2025 to July, 2025. The survey for the butterflies was done from the morning 7.30 am to 10 am, and 4 pm to 6 pm, which is the perfect time for the identification of the butterflies from selected sites., with observations made during walks through the Gajwel town gardens, greenery areas, Kalpakavanam Forest Park and Herbal Park, focusing on different habitats within the study area. Butterflies collected by the using of Sweep net for observation *(Okeke, T.E et al., 2024)*. Butterflies were identified based on field observations, and photographs of the species were taken using mobile phones to assist in accurate identification. These photographs were subsequently analysed for species verification. In the study, the butterfly's photographs were taken with the help of camera for the identification based on (Dey *et al.,* 2017). Based on the IUCN Red List, butterfly species were assessed as Least Concern species and Not Evaluated.

RESULTS AND DISCUSSION

A total 30 species of butterfly was Nymphalidae, Pieridae, Pailionidae, Lycaenidae families, during this study project for time period four months. Hence my study was done in the parks, gardens, around surrounding areas of Gajwel at different areas, belongs to various families of the 30 species recorded, during the survey. These species belonged to various families such as Nymphalidae, Pieridae, Papilionidae, Lycaenidae. Family Nymphalidae was the dominant among the five families with 16 (53.33%) species, followed by Pieridae comprising of 8 (26.66%) species, Papilionidae with composition of 5 (16.66%) species, Lycaenidae with one (3%) species. Nymphalidae was the most frequently sighted groups during this survey. Sprih Harsh (2014) reported to particularly in urban areas, many butterfly species rely on secondary forests or remnant vegetation to survive. About 95 butterfly species from Telangana's Kawal Tiger Reserve were identified by the study and

numerous butterfly species were found to be present in the Pulgampandri area, this region has a high diversity of butterflies by Deepa Jaiswal et al (2023).

Table 1: List of Butterfly Species Recorded in the Study Area

Serial No	Family Name	Scientific Name	Common Name	IUCN
1	Nymphalidae	*Acraea terpsicore (Linnaeus, 1758)*	Tawny coster	NE
2	Nymphalidae	*Byblia ilithyia (Drury, 1773)*	Spotted joker	NE
3	Nymphalidae	*Danaus chrysippus (Linnaeus, 1758)*	Plain tiger	LC
4	Nymphalidae	*Danaus genutia (Cramer, 1779)*	Striped tiger	NE
5	Nymphalidae	*Euploea core (Cramer, 1780)*	common crow	LC
6	Nymphalidae	*Hypolimnas misippus (Linnaeus, 1764)*	Danaid eggfly	LC
7	Nymphalidae	*Junonia almana (Linnaeus, 1758)*	Peacock pansy	LC
8	Nymphalidae	*Junonia lemonias (Linnaeus, 1758)*	Lemon pansy	NE
9	Nymphalidae	*Junonia orithya (Linnaeus, 1758)*	Blue pansy	LC
10	Nymphalidae	*Junonia atlites (Linnaeus, 1763)*	Gray pansy	NE
11	Nymphalidae	*Junonia iphita (Cramer, 1779)*	Chocolate pansy	NE
12	Nymphalidae	*Melanitis leda (Linnaeus, 1758)*	common evening brown	NE
13	Nymphalidae	*Neptis hylas (Linnaeus, 1758)*	Common sailor	NE
14	Nymphalidae	*Phalanta phalantha (Drury, 1773)*	Common leopard	LC
15	Nymphalidae	*Tirumala limniace (Cramer, 1775)*	Blue tiger	NE
16	Nymphalidae	*Vanessa cardui (Linnaeus, 1758)*	Painted lady	LC
17	Pieridae	*Belenois Aurota (Fabricius,1793)*	Pioneer white	LC
18	Pieridae	*Delias Eucharis (Drury, 1773)*	Common jezebel	NE
19	Pieridae	*Catopsilia Pomona (Fabricius,1775)*	Common Emigrant	NE
20	Pieridae	*Catopsilia pyranthe (Linnaeus, 1758)*	Molted Emigrant	NE
21	Pieridae	*Eurema Andersonii (Moore, 1886)*	One spot grass yellow	NE
22	Pieridae	*Eurema Brigitta (Cramer, 1780)*	Small grass yellow	LC
23	Pieridae	*Eurema lacteola (Distant, 1886)*	Common grass yellow	NE
24	Pieridae	*Pieris canidia (Sparrman, 1768)*	Cabbage white	NE
25	Papilionidae	*Pachliopta aristolochiae (Fabricius,1775)*	Common rose	LC
26	Papilionidae	*Pachliopta hectar (Linnaeus, 1758)*	Crimson rose	NE
27	Papilionidae	*Papilio crino (Fabricius,1792)*	common banded peacock	NE
28	Papilionidae	*Papilio domoleus (Linnaeus, 1758)*	Common lime	NE
29	Papilionidae	*Papilo Polytes (Linnaeus, 1758)*	Common Mormon	LC
30	Lycaenidae	*Chilades lajus (Stoll, 1780)*	India lime blue	NE

***IUCN**—International Union for Conservation of Nature; **NE**- Not Evaluated; **LC**- Least Concern*

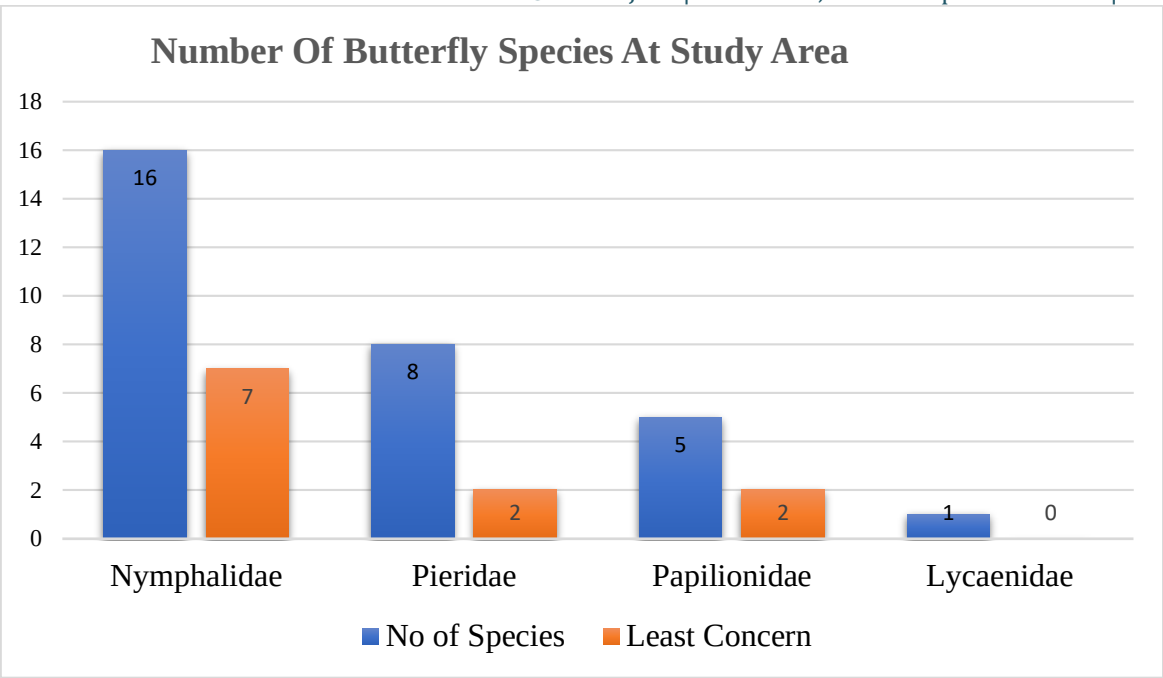

Fig 2: Number of Butterfly Species in Study Area.

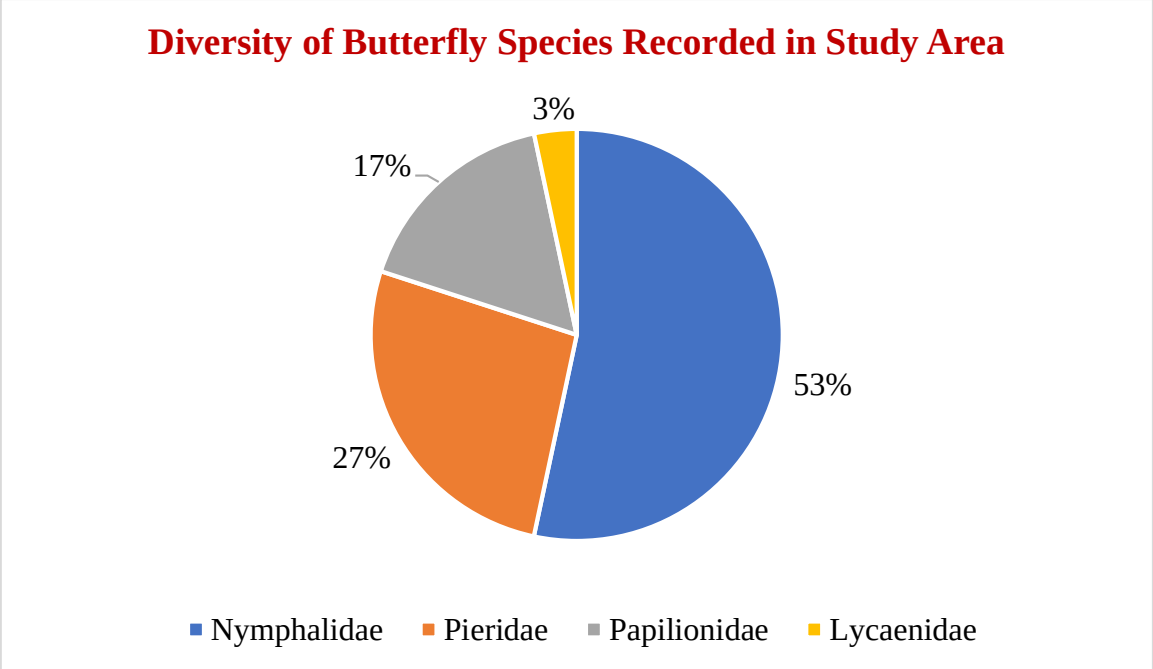

Fig 3. Family wise percentage composition of butterfly species in the study area.

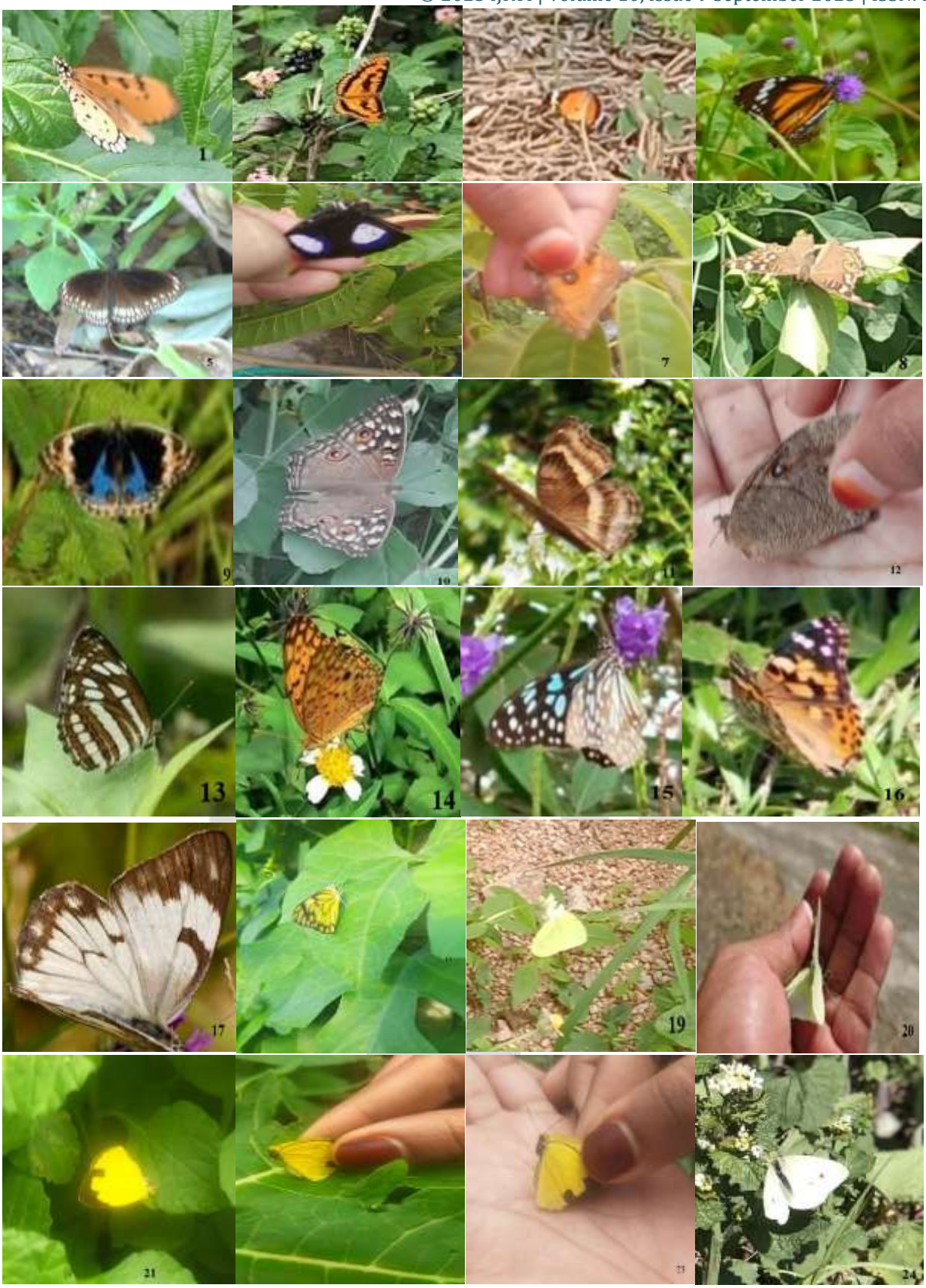
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Fig 4: Butterfly species from Gajwel town, Telangana. ***1. Acraea terpsicore, 2. Byblia ilithyia, 3. Danaus chrysippus, 4. Danaus genutia, 5. Euploea core, 6. Hypolimnas misippus, 7. Junonia almana, 8. Junonia lemonias, 9. Junonia orithya, 10. Junonia atlites, 11. Junonia iphita, 12. Melanitis leda, 13. Neptis hylas, 14. Phalanta phalantha, 15. Tirumala limniace, 16. Vanessa cardui, 17. Belenois Aurota, 18. Delias Eucharis, 19. Catopsilia Pomona, 20. Catopsilia pyranthe, 21. Eurema Andersonii, 22. Eurema Brigitta, 23. Eurema lacteola, 24. Pieris canidia, 25. Pachliopta aristolochiae, 26. Pachliopta hectar, 27. Papilio crino, 28. Papilio domoleus, 29. Papilo Polytes, 30. Chilades lajus.***

CONCLUSION

The Nymphalidae and Pieridae are largely abundant in least abundant is Lycaenidae family in Gajwel town, Telangana. Diversity butterfly normal this is because due to available to water resources. Still, Conservation is necessary to save the diversity butterfly. the present study is short in nature, but added valuable information on diversity of butterfly fauna and will contribute in developing effective conservation measures in Telangana.

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