A Study on the Diversity and Abundance of Butterfly Fauna in the Vicinity of Jadcherla town, Telangana, India

Subhashini Konakondla^{1*}; Ravinder Rao Bakshi²; Neeraja K.³

Assistant Professor of Zoology, MVS Govt. Degree College (A), Mahabubnagar, Telangana Assistant Professor of Zoology, Vivekananda Government Degree College (A), Vidyanagar, Hyderabad, Telangana

Publication Date: 2025/02/18

Abstract: Butterflies, as prominent flying arthropods, are not only vital pollinators but also serve as effective indicators of biodiversity. However, many of their natural habitats are under threat due to urbanization, overexploitation of biological resources, and unsustainable management practices. The decline in faunal diversity is a critical concern for biodiversity conservation efforts.

The present study, conducted during the 2020-21 academic year, aims to assess the abundance and diversity of butterfly species in the vicinity of Jadcherla town, in Mahabubnagar District. The town and its administration is committed for enhancing the diversity of flowering plants within its gardens and green areas. The primary objective of this survey was to evaluate the seasonal abundance and diversity of butterflies in relation to their host vegetation across various habitats.

A total of 53 butterfly species, belonging to 37 genera and 5 families, were recorded across different zones and habitats. The family Nymphalidae was the most dominant, comprising 22 species (42.3%), followed by Lycaenidae (21%) with 11 species, Pieridae (21%) with 11 species, Papilionidae (11%) with 6 species, and Hesperidae (5.7%) with 3 species. This study highlights the significance of preserving and conserving vegetation in the area to ensure the long-term sustainability of butterfly diversity.

Keywords: Butterfly Diversity, Faunal Diversity, Jadcherla Town, Pollinators, Habitat Conservation.

How to Cite: Subhashini Konakondla; Ravinder Rao Bakshi; Neeraja K. (2025). A Study on the Diversity and Abundance of Butterfly Fauna in the Vicinity of Jadcherla town, Telangana, India. *International Journal of Innovative Science and Research Technology*, 10(1), 2557-2562. https://doi.org/10.5281/zenodo.14885959.

I. INTRODUCTION

Nature is inherently beautiful, and its biodiversity plays a crucial role in maintaining ecological balance. Butterflies, with their vibrant colors and delicate wings, not only enhance the aesthetic value of nature but also play vital roles in various ecological processes. They contribute significantly for pollination, serve as food for specific predators, and act as indicators of plant biodiversity. As one of the most popular groups of fauna after birds, butterflies are closely linked to the occurrence and health of certain plants and animals. Both the adult butterflies and their larvae (caterpillars) serve as prey for several predators, including flycatcher birds, lizards, frogs, and toads (Aneesh et al., 2013).

Butterflies are integral to ecosystem services, such as nutrient cycling and providing food resources. Their presence and health are critical for the sustainability of various food webs, and their decline can disrupt these processes (Abdullahi et al., 2019). Due to their sensitivity to environmental changes, diurnal butterfly species are often used as bioindicators of habitat disturbance. However, from an agricultural perspective, butterfly larvae can be a major cause of crop damage, affecting yields due to their pest activity.

Globally, there are approximately 28,000 butterfly species, with the majority found in tropical regions. The Indian subcontinent, with its diverse terrain, climate, and vegetation, is home to around 1,504 butterfly species (Tiple, 2011). This represents about 8.74% of the world's total butterfly species, and butterflies account for approximately 65% of India's total fauna. In Telangana, 173 butterfly species have been recorded, contributing to the region's rich biodiversity.

Several abiotic and biotic factors, such as climate conditions, temperature, wind exposure, availability of host plants, food vegetation, and topographic features, influence Volume 10, Issue 1, January – 2025

ISSN No:-2456-2165

butterfly composition within a community (Barlow et al., 2007; Ravindra et al., 1996; Khan et al., 2004; Jain & Jain, 2012; Kharat et al., 2012; Kumaraswamy & Kunte, 2013; Amala et al., 2011). Changes in these factors, driven by climate change, urbanization, and pesticide use, significantly affect butterfly diversity. Shifts in rainfall patterns, temperature extremes, prolonged droughts, excessive rainfall, and heat waves can directly impact butterfly populations. Shrinking nectar resources and desiccation of host plants lead to increased mortality and can induce migratory behavior among species. As ectothermic organisms, butterflies are particularly vulnerable to climatic variations, and their short generation time makes them valuable model organisms for studying environmental impacts (Abdullahi et al., 2019).

In addition to climate change, human activities such as hunting, poaching, and forest fires have led to the decline of several butterfly species (Grewal, 1996). Consequently, many species are now at risk, even in protected areas (Ghazol, 2002; Solomon & Rao, 2002). Regular monitoring and updating of species composition, diversity, host plants, food plants, and distribution patterns are essential for effective conservation strategies, especially in protected ecosystems (Basavarajappa et al., 2018).

The present study aims to assess the butterfly diversity in the vicinity, Jadcherla town, Mahabubnagar District, Telangana. This study will help to raise awareness among students and local communities about the ecological importance of butterflies, their role in biodiversity conservation, and the need for habitat protection.

II. MATERIALS AND METHODS

https://doi.org/10.5281/zenodo.14885959

A. Study Area

Jadcherla town is located 85 kilometers south of Hyderabad and approximately 17 miles east of Mahabubnagar city, with geographical coordinates of 16°46'00" North and 78°09'00" East. The town is having many gardens and green areas, characterized by a rich diversity of vegetation. This town also holds Telangana botanical garden raised by Dr. Burgula Ramakrishna Rao Government Degree College.

B. Methodology

The students in the Department of Zoology at Dr. Burgula Ramakrishna Rao Government Degree College have a tradition of compiling animal albums, which document locally occurring faunal species for their practical lab studies. In the present study, butterfly species data were gathered from these student albums and compared with an existing checklist of butterfly diversity.

The fieldwork for this study was conducted through biweekly, random surveys in and around the areas of Jadcherla town during the year 2021, extending through November 2021. Surveys were conducted between 9:00 AM and 11:00 AM, with observations made during walks through the town gardens and green areas, focusing on different habitats within the study area. All data collection adhered to COVID-19 safety precautions.

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 analyzed for species verification.



Fig 1: Map of Study area - Jadcherla

ISSN No:-2456-2165

RESULTS AND DISCUSSION III.

Butterflies, second in popularity only to birds, play an essential role in the ecosystem by influencing the distribution of specific plants and animals. Both adult butterflies and their caterpillars serve as prey for various predators, including flycatcher birds, lizards, frogs, and toads. According to the Telangana State Biodiversity Board, approximately 173 species of butterflies have been recorded in Telangana.

In the present study, a total of 53 butterfly species were observed in and around the areas of Jadcherla Town. These species belong to five families:

- Papilionidae : 6 species
- Pieridae : 11 species
- Nymphalidae: 22 species

- Lycaenidae : 11 species
- Hesperidae : 3 species

Among these families, Nymphalidae was the most dominant, with 22 species (accounting for 42.3% of the observed species), while the Hesperidae family was represented by the fewest species (3 species). This distribution reflects the varying ecological niches and habitat preferences of these families in the study area.

https://doi.org/10.5281/zenodo.14885959

The findings indicate a rich butterfly diversity in the region, with the Nymphalidae family showing a particularly strong presence, which suggests favorable habitat conditions for these species. In contrast, the relatively smaller representation of Hesperidae may point to more specialized habitat requirements or less favorable conditions for this family in the study area.

C M.	1 a	Seientie Nerre	Alea (Jauchella)	C4-4
5. NO	Family	Scienuiic Name		Status
1		Belenois aurota aurota (Fabricius, 1793)	Indian Pioneer	Abundance
2		Catopsilia pomona (Fabricius, 1775)	Common Emigrant	A
3		Catopsilia pyranthe (Linnaeus, 1758)	Mottled Emigrant	0
4		Cepora nerissa (Fabricius, 1775)	Common Gull	A
5	Dissides (11)	Colotis danae (Fabricius, 1775)	Crimson-tip	С
6	Pieridae (11)	Delias eucharis (Drury, 1773)	Indian Jezebel	0
7		Eurema hecabe (Linnaeus, 1758)	Common Grass Yellow	A
8		Eurema laeta (Boisduval, 1836)	Spotless Grass Yellow	C
9		Ixias marianne (Cramer, [1779])	White Orange-tip	С
10		Ixias pyrene (Linnaeus, 1764)	Yellow Orange-tip	С
11		Pareronia valeria (Cramer, 1776)	Indian Wanderer	А
12		Graphium nomius (Esper, 1799)	Spot Swordtail	0
13		Graphium agamemnon (Linnaeus, 1758)	Tailed Jay	R
14		Papilio demoleus (Linnaeus, 1758)	Common Lime	А
15		Papilio polytes (Linnaeus, 1758)	Common Mormon	А
16	Papilionidae (6)	Pachliopta aristolochiae (Fabricius, 1775)	Common Rose	С
17		Pachliopta hector (Linnaeus, 1758)	Crimson Rose	С
18		Acraea terpsicore (Linnaeus, 1758)	Tawny Coster	А
19		Ariadne merione (Cramer, [1777])	Common Castor	С
20		Charaxes athamas (Drury, 1773)	Common Nawab	0
21		Charaxes solon (Fabricius, 1793)	Black Rajah	R
22		Danaus chrysippus (Linnaeus, 1758)	Plain Tiger	А
23		Danaus genutia (Cramer, [1779])	Striped Tiger	А
24	Nymphalidae (22)	Euploea core (Cramer, [1780])	Common Crow	А
25		Hypolimnas bolina (Linnaeus, 1758)	Great Eggfly	С
26		Hypolimnas misippus (Linnaeus, 1764)	Danaid Eggfly	С
27		Junonia almana (Linnaeus, 1758)	Peacock Pansy	С
28		Junonia atlites (Linnaeus, 1763)	Grey Pansy	0
29		Junonia hierta (Fabricius, 1798)	Yellow Pansy	А
30		Junonia iphita (Cramer, 1779)	Chocolate Pansy	С
31		Junonia lemonias (Linnaeus, 1758)	Lemon Pansy	А
32		Junonia orithya (Linnaeus, 1758)	Blue Pansy	А
33		Melanitis leda (Linnaeus, 1758)	Common evening	C
00			brown	
34		Neptis hylas (Linnaeus, 1758)	Common Sailer	R
35		Parantica aglea (Stoll, [1782])	Glassy Tiger	0
36		Phalanta phalantha (Drury, [1773])	Common Leopard	С
37		Symphaedra nais (Forster, 1771)	Baronet	0
38		Tirumala limniace (Cramer, 1775)	Blue Tiger	С

Table 1: List of Butterfly Species Observed in the Study Area (Jadcher	rla)
--	------

Volume 10, Issue 1, January – 2025

International Journal of Innovative Science and Research Technology

ISSN No:-2456-2165

https://doi.org/10.5281/zenodo.14885959

39		Tirumala septentrionis (Butler, 1874)	Dark blue Tiger	R		
40		Caleta decidia (Hewitson, 1876)	Angled Pierrot	R		
41		Castalius rosimon (Fabricius, 1775)	Common Pierrot	А		
42		Catochrysops strabo (Fabricius, 1793)	Forget-me-not	С		
43		Chilades lajus (Stoll, [1780])	Lime Blue	А		
44	Lycaenidae (11)	Chilades parrahasius (Fabricius, 1793)	Small Cupid	С		
45		Euchrysops cnejus (Fabricius, 1798)	Gram Blue	А		
46		Jamides celeno (Cramer, [1775])	Common Cerulean	С		
47		Leptotes plinius (Fabricius, 1793)	Zebra Blue	0		
48		Spindasis vulcanus (Fabricius, 1775)	Common Silverline	0		
49		Talicada nyseus (Guérin-Méneville, 1843)	Red Pierrot	С		
50		Zizula hylax (Fabricius, 1775)	Tiny Grass Blue	А		
51		Hasora chromus (Cramer, 1780)	Common Banded Awl	0		
52	Hesperiidae (3)	Spialia galba (Fabricius, 1793)	Indian Grizzled Skipper	A		
53		Telicota bambusae (Moore, 1878)	Dark Palm-Dart	0		

* Abundant - A; Common - C; Occasional - O; Rare - O

Butterfly diversity in Jadcherla Town





Fig 3: Percentage Composition of Butterfly Species in the Study Area -Family Wise

Volume 10, Issue 1, January – 2025 ISSN No:-2456-2165

International Journal of Innovative Science and Research Technology https://doi.org/10.5281/zenodo.14885959





Fig 4: Pictures of various butterfly species found in Jadcherla Town

ACKNOWLEDGMENTS

The members of this project would like to express their sincere gratitude to Dr. C.H. Appiya Chinnamma, Principal of Dr. Burgula Ramakrishna Rao Government College, for granting permission to conduct the field survey in and around Jadcherla town. We also extend our thanks to the faculty and staff members of the Department of Zoology for their support throughout the project. Special thanks are due to the students who contributed photographs of butterflies during the course of this study. Their assistance and encouragement were invaluable, and we deeply appreciate their support.

REFERENCES

- Amala, S., Rajkumar, M., & Anuradha, V. (2011). Species richness of butterflies in the selected areas of Siumalai Hills. *International Journal of Pure and Applied Science and Technology*, 6(2), 89-92.
- [2]. Aneesh, K. S., Adarsh, C. K., & Nameer, P. O. (2013). Butterflies of Kerala Agricultural University (KAU) Campus, Thrissur, Kerala, India. *Journal of Threatened Taxa*, 5(9), 422-440.
- [3]. Barlow, J., Overal, W. L., Araujo, I. S., Gardner, T. A., & Carlos, A. P. (2007). The value of primary, secondary, and plantation forests for fruit-feeding butterflies in the Brazilian Amazon. *Journal of Applied Ecology*, 44, 1001-1012.
- [4]. Basavarajappa, S., Gopi Krishna, V., & Santhosh, S. (2018). Butterfly species composition and diversity in a protected area of Karnataka, India. *International Journal of Biodiversity and Conservation*, 10(10), 432-443.
- [5]. Bonebrake, T. C., & Sorto, R. (2009). Butterfly (Papilionoidea and Hesperioidea) rapid assessment of a coastal countryside in El Salvador. *Tropical Conservation Science*, 2(1), 34-51.

- [6]. Bonebrake, T. C., Ponisio, L. C., Boggs, C. L., & Ehrlich, P. R. (2010). More than just indicators: A review of tropical butterfly ecology and conservation. *Biological Conservation*, 143, 1831-1841.
- [7]. Daily, G. C., & Ehrlich, P. R. (1991). Preservation of biodiversity in small rainforest patches: Rapid evaluations using butterfly trapping. *Biodiversity and Conservation*, *4*, 35-55.
- [8]. Dey, P., Payra, A., & Mondal, K. (2017). A study on butterfly diversity in Singur, West Bengal, India. *Journal of e-planet*, 15(1), 73-77.
- [9]. Erhardt, A. (1985). Diurnal Lepidoptera: Sensitive indicators of cultivated and abandoned grassland. *Journal of Applied Ecology*, 22, 849-861.
- [10]. Ghazol, J. (2002). Impact of logging on the richness and diversity of forest butterflies in a tropical dry forest in Thailand. *Biological Conservation*, 11, 521-541.
- [11]. Grewal, B. (1996). Friends of butterflies. Sanctuary Asia, 16, 4-17.
- [12]. Inouye, D. W. (2001). Role of pollinators. In *Encyclopedia of Biodiversity* (Vol. 4, pp. 730-732). Academy Press.
- [13]. Jain, N., & Jain, A. (2012). Butterfly diversity of Hadoti Region, Rajasthan, India. *Flora and Fauna*, 18(2), 274-276.
- [14]. Khan, M. R., Khurshid, A., Ikram, B., Malik, A. I., & Mir, A. (2004). Biodiversity of butterflies from district Pooch and Sudhnoti, Azad Kashmir. *Asian Journal of Plant Sciences*, 3(5), 556-560.
- [15]. Swamy, K. (2021). Rhopalocera: Butterflies of Mahavir Harina Vanasthali National Park, Hyderabad, Telangana State. *Biological Forum – An International Journal*, 13(1), 517-523.