Uttar Pradesh Journal of Zoology

Volume 46, Issue 5, Page 48-58, 2025; Article no.UPJOZ.4642
ISSN: 0256-971X (P)

A Preliminary List of Butterflies (Rhophalocera) from Tala, Raigad, Maharashtra, India

Sujeet Jamdar [a*]

[a] *Department of Zoology, G. M. Vedak College of Science, Tala-Raigad (M. S.), India.*

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: https://doi.org/10.56557/upjoz/2025/v46i54822

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://prh.mbimph.com/review-history/4642

Original Research Article

Received: 15/12/2024
Accepted: 19/02/2025
Published: 21/02/2025

ABSTRACT

The aim of this study was to evaluate butterfly diversity in the Tala region of Raigad district, Maharashtra. The study recorded 41 butterfly species from 29 genera across 5 families. The *Nymphalidae* family was the most abundant, with 14 genera and 21 species, followed by *Pieridae* with 7 genera and 9 species, *Satyridae* with 5 genera and 7 species, *Papilionidae* with 2 genera and 3 species, and *Hesperiidae* with 1 genus and 1 species. The results provide important information about the butterfly biodiversity in the area and serve as foundational data for future studies on butterfly populations.

Keywords: Diversity; butterfly; lepidoptera; tala; Nymphalidae.

**Corresponding author: Email: sujeetjamdar@gmail.com;*

Cite as: *Jamdar, Sujeet. 2025. "A Preliminary List of Butterflies (Rhophalocera) from Tala, Raigad, Maharashtra, India". UTTAR PRADESH JOURNAL OF ZOOLOGY 46 (5):48-58. https://doi.org/10.56557/upjoz/2025/v46i54822.*

1. INTRODUCTION

Tala is a small town 18.4388° N, 73.1261° E situated an elevation of 20 m above MSL in the Raigad district of Maharashtra's Konkan region. The mean minimum temperature is 17.7°C and mean maximum temperature is 31.8°C. with significantly higher temperatures during the summer months and cooler temperatures during the monsoon season, experiencing a tropical climate with high humidity throughout the year. Biological diversity refers to the variety and variability of living organisms and their ecological interactions (Harper, 1995). Biodiversity forms the foundation of ecological integrity, supports sustainable development, ensures environmental stability, and provides economic and ecological security for future generations. India, the seventh-largest country globally, ranks among the twelve mega biodiversity nations and harbours approximately 80% of its insect species as endemics. The order Lepidoptera constitutes nearly 10% of the total known animal species, a figure comparable to the number of recognized flowering plant species (Srivastava, 2002).

The Western Ghats, designated as a global mega biodiversity hotspot, significantly contribute to India's entomofaunal diversity, with approximately 800,000 insect species documented. The diversity and distribution of butterfly species are strongly influenced by the availability of host plants within their habitats (Kunte, 2000). Plant species provides essential food and egg-laying sites for butterflies, which in turn plays a crucial role in determining the diversity and abundance of butterfly species found in the area (Malek et al., 2024).

As the second-largest order within the class Insecta, Lepidoptera is of considerable ecological significance. Approximately 1,500 butterfly species have been identified from the Indian subcontinent, accounting for 8.33% of the 18,000 butterfly species documented worldwide (Hampson, 1891; Smetacek, 1992, 2002; Gay T, 2012). A substantial proportion of these species are concentrated within the Himalayan and Western Ghats regions (Larsen TB, 1987). Butterflies play critical roles in ecosystem functioning, serving as both pollinators and herbivores (Kunte, 2000; Tiple, 2006). They have co-evolved with angiosperms, relying on nectar as adults and host plant foliage during larval stages (Ehrlich, 1964). Furthermore, butterflies are widely recognized as bio-indicator species due to their sensitivity to habitat alterations, rapid response to environmental perturbations, specific vegetation associations, and ease of sampling (Erhardt A., 1985; Brown, 1991; Kremen, 1992; Thomas, 2005; Bonebrake, 2010; Gowda, 2011; Sethy, 2014). Migratory behaviour of butterflies associated with their genetic diversity (García-Berro A et. al., 2023).

Anthropogenic disturbances such as habitat fragmentation, urbanization, and pollution have exacerbated environmental changes, leading to biodiversity decline. Habitat loss, primarily due to land-use transformation, directly impacts species survival and ecological balance (Choudhury, 2009; Saikia, 2010; Singh, 2011; Gogoi M.J., 2013; Joshi, 2014; Naro, 2014; Pollard, 1977). Insects contribute substantially to ecosystem processes within both aquatic and terrestrial habitats, providing essential services such as pollination, pest control, nutrient cycling, and overall ecosystem stability. Among insect taxa, butterflies are particularly significant due to their aesthetic appeal and their crucial function as pollinators (Tiple et al., 2006).

In the Tala region, ongoing anthropogenic activities, including road construction towards Agardanda Port leads to substantial habitat degradation, potentially influencing butterfly populations. Despite the ecological importance of butterflies, no prior systematic studies have been conducted on their diversity within this region. Therefore, the present study was undertaken to document butterfly diversity in and around Tala, Raigad district, Maharashtra. The findings aim to establish a baseline inventory of butterfly species, evaluate the extent of human-induced habitat modifications, and contribute to future conservation initiatives in the region. This will provide a groundwork for future study.

2. MATERIALS AND METHODS

2.1 Study Area

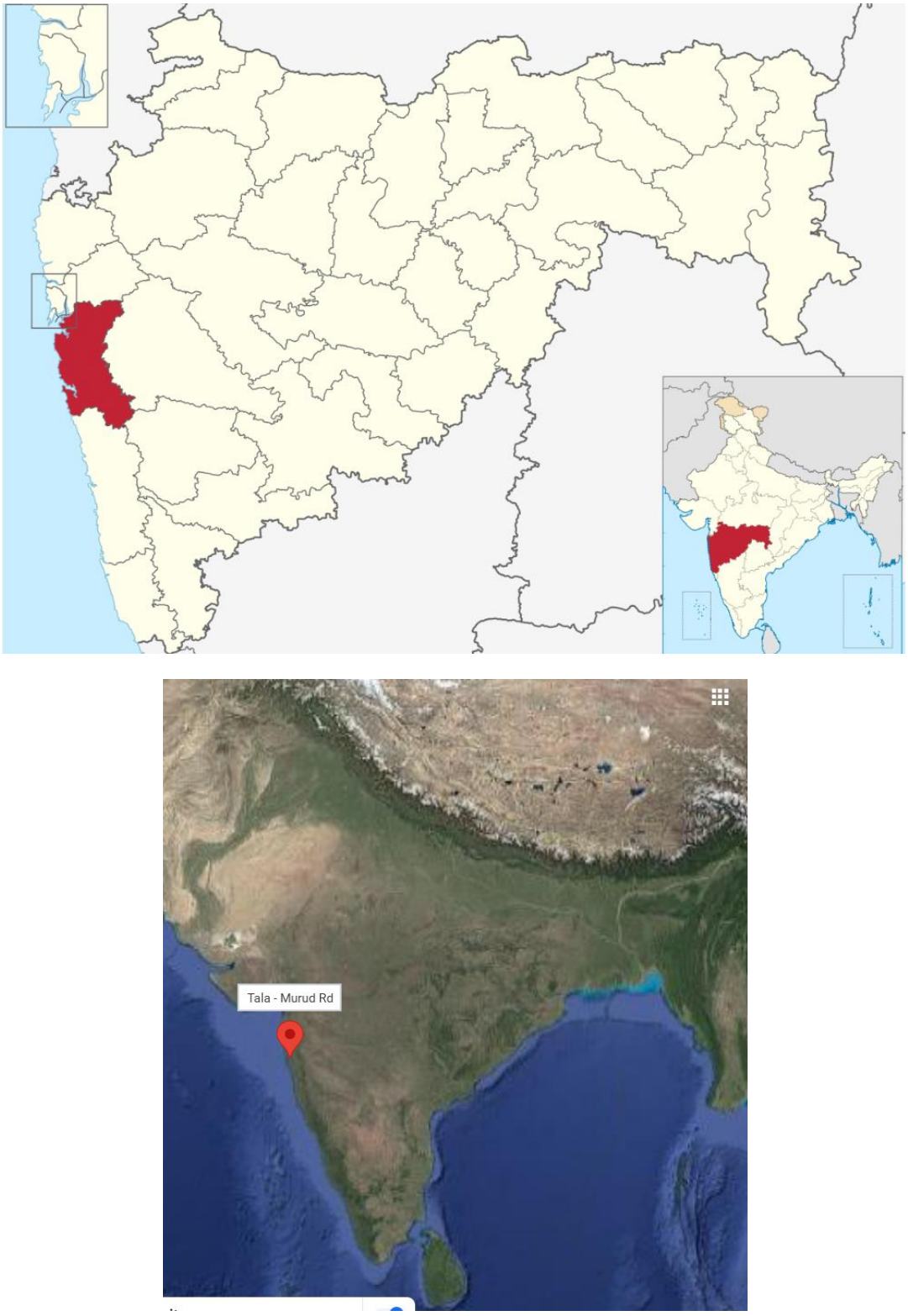

Fig. 1. Map showing study area

2.2 Methodology

Butterflies were recorded along designated paths within the study area (Fig. 1) and along water streams. The selected sites were surveyed over a one-year period from June 2022 to May 2023 to assess butterfly biodiversity. Field observations were conducted using the Pollard Walk Method (1977). Surveys were carried out weekly between 09:00 and 15:00 hours during sunny periods to document butterfly species through photography along transects. Lycaenid and hesperiidae butterflies were captured in nets when necessary, identified, and subsequently released. Photographs of butterflies were taken using a Canon 1300D camera. Species identification was conducted using the identification keys provided by Evans (1932), Kehimkar (2008), Kunte (2000), and Wynter-Blyth (1957), with classification following the system outlined by Kehimkar (2008).

3. RESULTS AND DISCUSSION

In the current study, a total of 41 lepidopteran species from 29 genera and 5 families were recorded (Tables 1 & 2; Fig. 2). Among the 6 families, *Nymphalidae* was the most diverse, with 14 genera and 21 species, followed by *Pieridae* with 7 genera and 9 species, *Satyridae* with 5 genera and 7 species, *Papilionidae* with 2 genera and 3 species, and Hesperiidae with 1 genus and 1 species (Figs. 3 & 4). The highest species diversity was observed in *Nymphalidae*, which accounted for 21 species (50%), followed by *Pieridae* with 9 species (21.42%), *Satyridae* with 7 species (19.04%), *Papilionidae* with 3 species (7.1%), and *Hesperiidae*, which had the fewest species, comprising just 2.38% of the total. Similar results were obtained by Tingare B. P. (2024) in Raigad district, recorded 73 species from 5 families & *Nymphalidae* was most diverse.

Butterflies (Lepidoptera: Rhophalocera) are valuable for their role in pollination, serve as ecological indicators, and are admired for their aesthetic appeal (Rosenberg, 1986; Johnson, 1995; Chakravarthy AK, 1997; McGeoch, 1998; Vu Van Lien, 2007). Factors such as the availability of food (host plants and nectar plants) and the microclimate significantly influence butterfly diversity (Öckinger E, 2006, 2009; Mukherjee M, 2012; Mukherjee K, 2018).

Table 1. List of families with number of genera & species of butterflies recorded in study area

Sr. No.	Family	Genera	Species	Species %
1	Papilionidae	02	03	7.1
2	Hesperiidae	01	01	2.38
3	Pieridae	07	09	21.42
4	Nymphalidae	14	21	50
5	Satyridae	05	07	19.04
	Total	29	41	

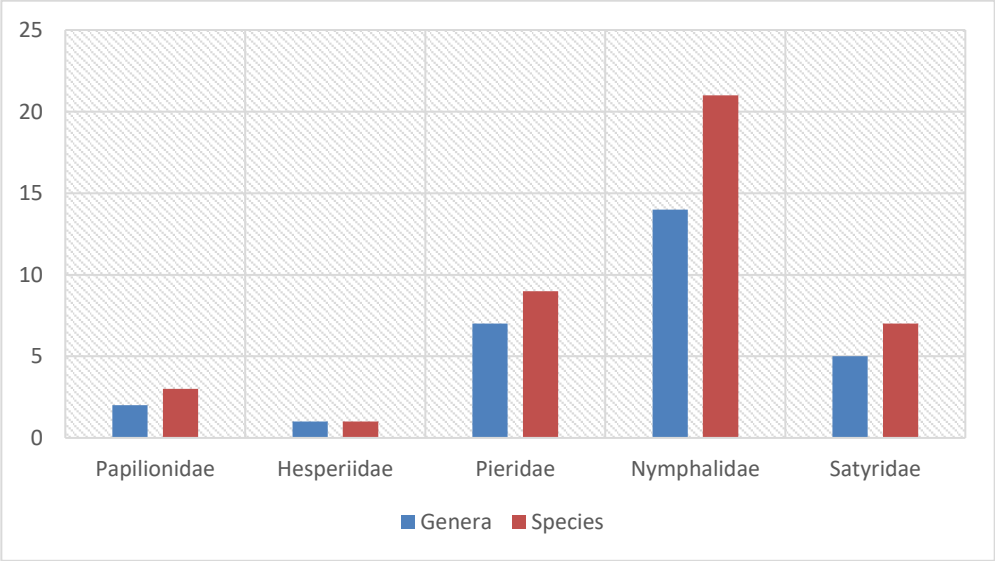

Fig. 2. Occurrences of butterfly species under different families

Table 2. Checklist of Butterflies (Insecta: Lepidoptera) recorded in study area

Sr. No.	Family	Scientific Name	Common Name	IUCN Status
I	Papilionidae	*Graphium doson* (C. & R. Felder, 1864)	Common Jay	NE
		Papilio demoleus (Linnaeus, 1758)	Lime Butterfly	NE
		Papilio polytes (Linnaeus, 1758)	Common Mormon	LC
II	Hesperiidae	*Aeromachus dubius* (Elwes& Edwards, 1897)	Dingy Scrub Hopper	NE
III	Pieridae	*Catopsilia pyranthe* (Linnaeus, 1758)	Mottled Emigrant	NE
		Colotis amata (Cramer, 1775)	Small Salmon Arab	NE
		Delias eucharis (Drury, 1773)	Common Jezebel	NT
		Eurema brigitta (Stoll, 1780)	Small Grass Yellow	NE
		Eurema hecabe (Linnaeus, 1758)	Common Grass Yellow	LC
		Eurema nilgiriensis (Yata, 1990)	Nilgiri Grass Yellow	NE
		Leptosia nina (Fabricius, 1793)	Psyche	NE
		Pareronia hippie (Cramer, 1776)	Common Wanderer	NE
		Prioneris sita (C. & R. Felder, 1865)	Painted Sawtooth	NE
IV	Nymphalidae	*Acraea violae* (Fabricius, 1793)	Tawny Coster	NE
		Ariadne ariadne (Linnaeus, 1763)	Angled Castor	NE
		Cirrochroa thais (Fabricius, 1787)	Tamil Yeoman	LC
		Danaus chrysippus (Linnaeus, 1758)	Plain Tiger	LC
		Euploea core (Cramer, 1780)	Common Crow	LC
		Euploea klugii (Moore, 1858)	King Crow	NE
		Euploea sylvester (Fabricius, 1793)	Double-branded Crow	NE
		Hypolimnas bolina (Linnaeus, 1758)	Great Eggfly	NE
		Hypolimnas misippus (Linnaeus, 1764)	Danaid Eggfly	LC
		Junonia almana (Linnaeus, 1758)	Peacock Pansy	LC
		Junonia atlites (Linnaeus, 1763)	Gray Pansy	NE
		Kallima horsfieldi (Kollar, 1844)	Southern Blue Oakleaf	NE
		Melanitis leda (Linnaeus, 1758)	Common Evening Brown	LC
		Mycalesis mineus (Linnaeus, 1758)	Dark-brand Bushbrown	CR
		Mycalesis perseus (Fabricius, 1775)	Common Bushbrown	NE
		Mycalesis visala (Moore, 1858)	Long-brand Bushbrown	NE
		Neptis jumbah (Moore, 1858)	Chestnut-streaked Sailer	NE
		Parantica aglea (Stoll, 1782)	Glassy Tiger	NE
		Phalanta alcippe (Stoll, 1782)	Small Leopard	NE

Sr. No.	Family	Scientific Name	Common Name	IUCN Status
		Tirumala limniace (Cramer, 1775)	Blue Tiger	NE
		Tirumala septentrionis (Butler, 1874)	Dark Blue Tiger	NT
V	Satyridae	*Melanitis phedima* (Cramer, 1780)	dark evening brown	NE
		Elymnias hypermnestra undularis (Linnaeus, 1763)	Common Palmfly	NE
		Lethe rohria (Fabricius, 1787)	common treebrown	NE
		Lethe europa europa (Fabricius, 1775)	bamboo treebrown	NE
		Ypthima huebneri (Kirby, 1871)	common four-ring	NE
		Ypthima baldus (Fabricius, 1775)	common five-ring	NE
		Melanitis leda ismene (Linnaeus, 1758)	rice butterfly	LC

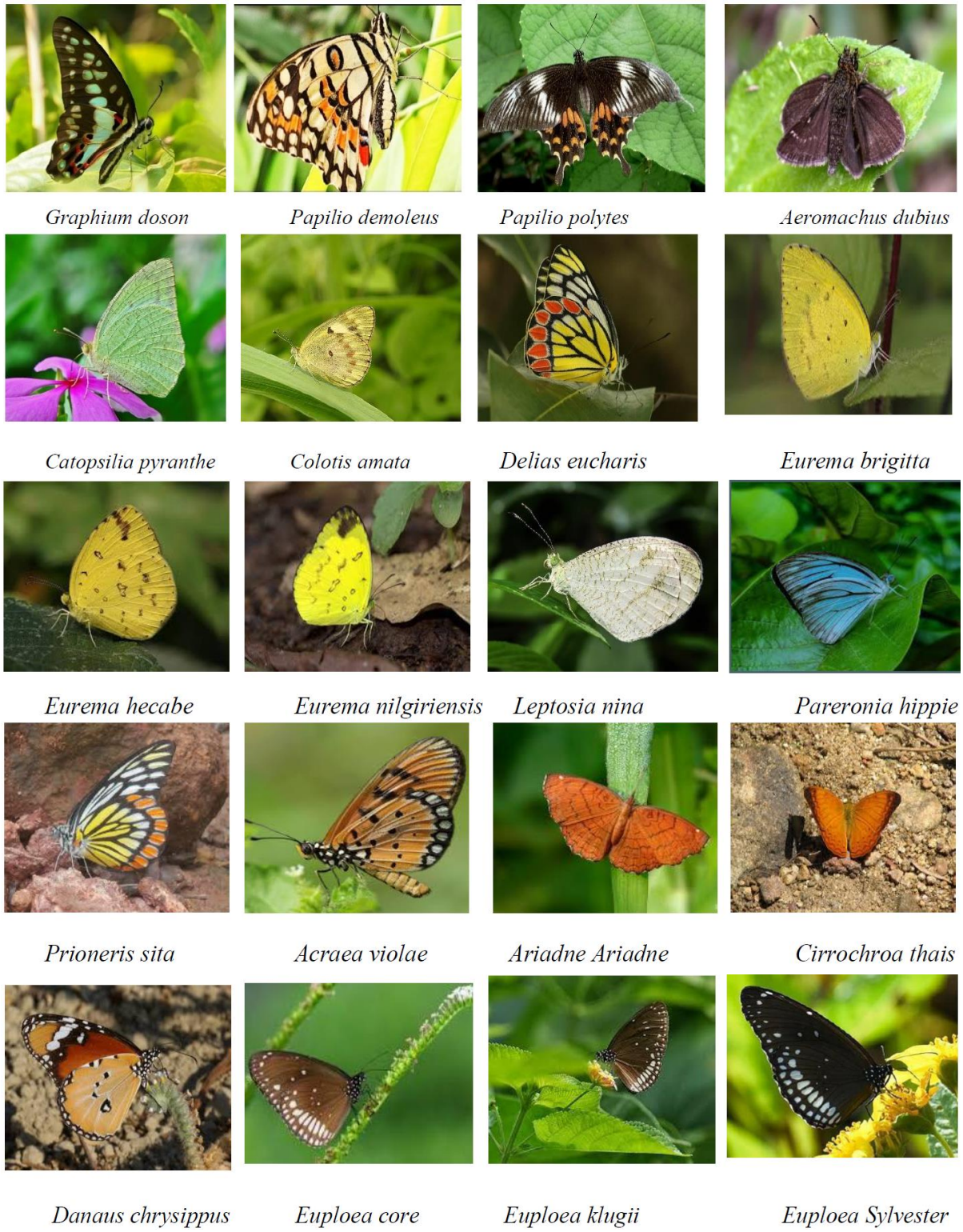

Fig. 3. Butterflies species recorded in study area

The study area, rich in vegetation that provides food sources for butterflies, has led to the recording of a large number of species. The *Nymphalidae* family is the largest, accounting for nearly one-third of the world's known butterflies. The high biodiversity of nymphalids and lycaenids in this study aligns with previous research on butterfly diversity (Dronamraju,

1960; Roy, 2010; Harsh S., 2014; Mukherjee, 2015). These families dominate due to the polyphagous nature of many species, their ecological adaptability (Jiggins CD, 1996), speciation, and high dispersal capabilities (Adler GH, 1996). Additionally, many species in these families are strong, active fliers, which helps them search for habitats and food over large areas (Eswaran R, 2005; Padhye AD, 2006; Krishnakumar N, 2008; Raut NB, 2010). Butterflies are effective indicators of anthropogenic disturbances and habitat quality (Kocher SD, 2000).

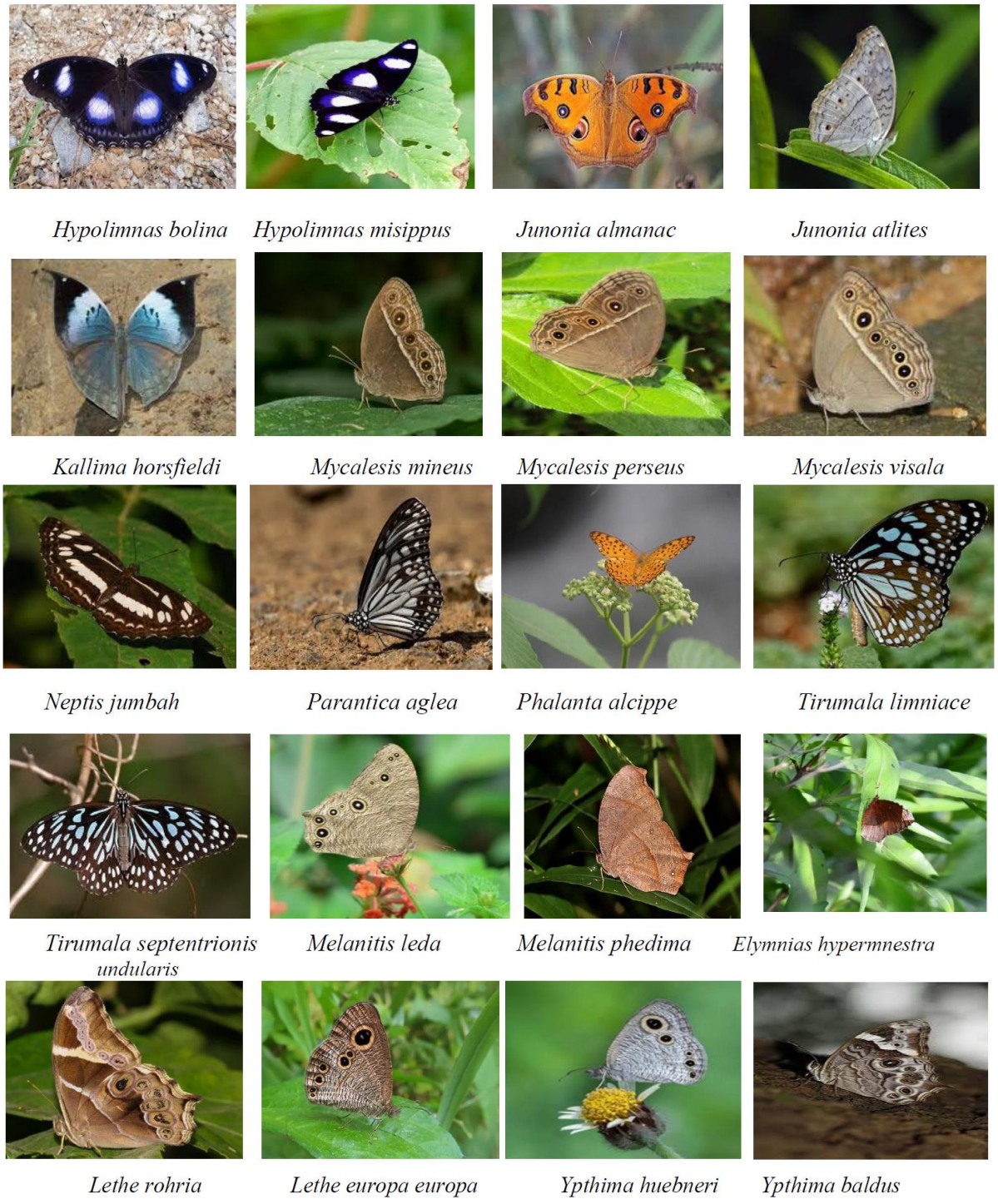

Fig. 4. Butterflies species recorded in study area

As this study serves as the first preliminary exploration of butterfly diversity in the area, conclusions regarding the loss of butterfly species cannot yet be drawn. The butterfly checklist created in this study will provide a foundation for future research. Further in-depth studies on butterfly diversity are necessary to expand the species list and assess the impact of anthropogenic changes on habitats in the Tala region.

4. CONCLUSION

Butterflies (Lepidoptera: Rhophalocera) are valuable for their role in pollination, serve as ecological indicators, and are admired for their aesthetic beauty. Key factors influencing butterfly diversity include the availability of food, habitat, and microclimate. Human activities contribute to habitat destruction and the loss of food plants.

In this study, a total of 41 butterfly species from 29 genera and 5 families were recorded. As there are no previous records of butterfly species for this area, it is not possible to confirm any changes in butterfly diversity. This preliminary study is the groundwork for future research on the ecology, biology, and conservation of butterflies in the region. Further, more detailed studies are needed to enhance the butterfly species checklist and evaluate the impact of human-induced changes on butterfly diversity.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

Adler, G. H., & Dudley, R. (1996). Biogeography of milkweed butterflies (*Nymphalidae*, Danainae) and mimetic patterns on tropical Pacific archipelagos. *Biological Journal of the Linnean Society*, *57*, 317-326.

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*(8), 1831-1841.

Brown, K. S. (1991). The conservation of insects and their habitats. *Conservation of Neotropical Environment: Insects as Indicators: 15th Symposium of the Royal Entomological Society of London*. Academic Press.

Chakravarthy, A. K., Rajagopal, D., & Jagannatha, R. (1997). Insects as bioindicators of conservation in the tropics. *Zoos' Print*, *12*, 11-25.

Choudhury, K., & Ghosh, S. (2009). Butterflies of Chakrashila Wildlife Sanctuary, Assam. *Indian Forester*, *135*(5), 714-720.

Dronamraju, K. R. (1960). Selective visits of butterflies to flowers: A possible factor in sympatric speciation. *Nature*, *186*(4719), 178.

Ehrlich, P. R., & Raven, P. H. (1964). Butterflies and plants: A study in coevolution. *Evolution*, *18*(4), 586-608.

Erhardt, A. (1985). Diurnal lepidoptera: Sensitive indicators of cultivated and abandoned grassland. *Journal of Applied Ecology*, *22*, 849-861.

Eswaran, R., & Pramod, P. (2005). Structure of butterfly community of Anaikatty Hills, Western Ghats. *Zoo's Print Journal*, *20*(8), 1939-1942.

Evans, W. H. (1932). *Identifications of Indian Butterflies*. Bombay Natural History Society.

García-Berro, A., Talla, V., Vila, R., Wai, H. K., Shipilina, D., Chan, K. G., Pierce, N. E., Backström, N., & Talavera, G. (2023). Migratory behaviour is positively associated with genetic diversity in butterflies. *Molecular Ecology*, *32*(3), 560-574.

Gay, T., Kehimkar, I. D., & Punetha, J. C. (1992). *Common butterflies of India*. Oxford University Press.

Gogoi, M. J. (2013). Notes on some skipper butterflies (Lepidoptera: Hesperiidae) from Panbari Forest and its adjoining areas, Kaziranga Karbi Anglong, upper Assam, India. *Journal of Threatened Taxa*, *5*(13), 4759-4768.

Gowda, R. H. T., Kumar, V., Pramod, A. F., & Hosetti, B. B. (2011). Butterfly diversity, seasonality and status in Lakkavalli range of Bhadra Wildlife Sanctuary, Karnataka. *World Journal of Science and Technology*, *1*(11), 67-72.

Hampson, G. F. (1891). *The Lepidoptera Heterocera of the Nilgiri district*.

Typological specimen of Heterocera of British Museum, *8*, 1.

Harper, J. L., & Hawksworth, D. L. (Eds.). (1995). *Biodiversity measurement and estimation*. Royal Society.

Harsh, S. (2014). Butterfly diversity of Indian Institute of Forest Management, Bhopal, Madhya Pradesh, India. *1-4*.

Jiggins, C. D., McMillan, W. O., Neukirchen, W., & Mallet, J. (1996). What can hybrid zones tell us about speciation? *Biological Journal of the Linnean Society*, *59*, 221-242.

Johnson, S., & Steiner, M. (1995). Long-proboscid fly pollination of two orchids in the Cape Drakensberg Mountains, South Africa. *Journal of South African Botany*, *195*, 169-175.

Joshi, R. K., & Dhyani, S. (2014). Butterflies, diversity, distribution, and threats in Dibru-Saikhowa Biosphere Reserve, Assam, North-East India: A review. *World Journal of Zoology*, *9*(4), 250-259.

Kehimkar, I. (2008). *The book of Indian Butterflies*. Bombay Natural History Society & Oxford University Press.

Kocher, S. D., & Williams, E. H. (2000). The diversity and abundance of North American butterflies vary with habitat disturbance and geography. *Biological Conservation*, *27*(4), 785-794.

Kremen, C. (1992). Assessing the indicator properties of species assemblages for natural areas monitoring. *Ecological Applications*, *2*(2), 203-217.

Krishnakumar, N., Kumaraguru, A., Thiyagesan, K., & Asokan, S. (2008). Diversity of *Papilionidae* butterflies in the Indira Gandhi Wildlife Sanctuary, Western Ghats, Southern India. *Tiger Paper*, *35*, 1-8.

Kunte, K. (2000). *Butterflies of peninsular India*. Universities Press & Indian Academy of Sciences.

Larsen, T. B. (1987). The butterflies of the Nilgiri Mountains of South India: Lepidoptera Rhopalocera. *Journal of the Bombay Natural History Society*, *84*, 26-43.

Malek, S., Patel, M., & Desai, B. (2024). Butterfly diversity of Navsari Agricultural University (NAU), Navsari, Gujarat, India. *Journal of Advanced Biology and Biotechnology*, *27*(9), 44-53. https://doi.org/10.9734/jabb/2024/v27i91272

McGeoch, M. A. (1998). The selection, testing, and application of terrestrial insects as bioindicators. *Biological Review*, *73*, 181-201.

Mukherjee, K., & Ghosh, D. (2018). Common banded peacock: Record of new larval host plant of *Papilio crino* from Bankura, West Bengal. *33*(12), 11-14.

Mukherjee, M., & Mukhopadhyay, S. K. (2012). Butterfly diversity and abundance with reference to habitat heterogeneity in and around Neora Valley National Park, West Bengal, India. *10*(1), 53-60.

Mukherjee, S. S., Banerjee, G. K., Saha, P., & Basu, A. G. (2015). Butterfly diversity in Kolkata, India: An appraisal for conservation management. *Journal of Asia-Pacific Biodiversity*, *8*(3), 210-221.

Naro, T., & Sondhi, S. (2014). Butterflies (Lepidoptera) of Chizami, Phek District, Nagaland, India. *Journal of Threatened Taxa*, *6*(13), 6593-6634.

Öckinger, E., Eriksson, A. K., & Smith, H. G. (2006). Effects of grassland abandonment, restoration, and management on butterflies and vascular plants. *Biological Conservation*, *133*(3), 291-300.

Padhye, A. D., Dahanukar, N., Paingankar, M., Deshpande, M., & Deshpande, D. (2006). Seasonality and landscape-wise distribution of butterflies in Tamhini, Northern Western Ghats, India. *Zoo's Print Journal*, *21*(3), 2175-2181.

Pollard, E. (1977). A method for assessing changes in the abundance of butterflies. *Biological Conservation*, *12*(2), 115-134.

Raut, N. B., & Pendharkar, A. (2010). Butterfly (Rhopalocera) fauna of Maharashtra Nature Park, Mumbai, Maharashtra, India. *Zoo's Print Journal*, *6*(1), 22-25.

Rosenberg, D. M., Danks, H. V., & Lehmkuhl, D. M. (1986). Importance of insects in environmental impact assessments. *Environmental Management*, *10*, 773-783.

Roy, A. B., Ghosh, U., & Kunte, K. (2010). Sighting of *Elymnias panther* (Lepidoptera: Nymphalidae: Satyrinae) in West Bengal, eastern India. *Journal of Threatened Taxa*, *2*(1), 670-671.

Saikia, M. K., Kalita, J., & Saikia, P. K. (2010). Seasonality of *Nymphalidae* butterflies in Gani-Garbhanga Reserve Forest, Assam, India. *NeBIO*, *1*(4), 10-21.

Sethy, J., Behera, S., & Singh, Chauhan. (2014). Species diversity of butterflies in the southeastern part of Namdapha Tiger Reserve, Arunachal Pradesh, India. *Asian Journal of Conservation Biology*, *3*(1), 75-82.

Singh, M. I., Gupta, A., & Varatharajan, R. (2011). Butterfly fauna of the Keibul

Lamjao National Park, Manipur, North East India. *Current Science*, *101*(6), 719-721.

Smetacek, P. (1992). Record of *Plebejus eversmanni* (Staudinger) (Lepidoptera: Lycaenidae) from India. *Journal of the Bombay Natural History Society*, *89*, 385-386.

Smetacek, P. (2002). Factors affecting distribution of *Pontia daplidice* in the Palaearctic region. *Journal of the Bombay Natural History Society*, *99*(2), 169-170.

Srivastava, A. (2002). *Taxonomy of moths in India*. International Book Distributors.

Thomas, J. A. (2005). Monitoring change in the abundance and distribution of insects using butterflies and other indicator groups. *Philosophical Transactions of the Royal Society B*, *360*(1454), 339-357.

Tingare, B. P. (2024). Assessment of butterfly diversity in Mahad Taluka, Western Ghats, Maharashtra, India. *International Journal of Advanced Research in Science, Communication & Technology*, *4*(3), 135-138.

Tiple, A. D., Deshmukh, V. P., & Dennis, R. L. H. (2006). Factors influencing nectar plant resource visits by butterflies on a university campus: Implications for conservation. *Biological Conservation*, *28*, 213-224.

Vu Van Lien. (2007). Ecological indicator role of butterflies in Tam Dao National Park, Vietnam. *Russian Entomological Journal*, *16*, 473-480.

Wynter-Blyth, M. A. (1957). *Butterflies of the Indian Region*. Bombay Natural History Society.

Peer-review history:
The peer review history for this paper can be accessed here:
https://prh.mbimph.com/review-history/4642