# Butterfly Diversity and Species Composition of Lumbini Butterfly Park, Gundgurti, Kalaburagi, Karnataka

**PRASANNAKUMAR SHASTRIMATH [1]***
*[1]Department of Post Graduate Studies and Research in Zoology, Gulbarga University, Kalaburagi, Karnataka, India.*
https://orcid.org/0009-0005-7211-2890

**RAJSHEKAR CHINMALLI[2]**
*[2]Department of Post Graduate Studies and Research in Zoology, Government College (Autonomous), Kalaburagi, Karnataka, India.*
**ORCID 0000-0002-7980-4241**

## Abstract:

Given that butterflies are sensitive bioindicators of environmental health, urban green areas and maintained ecological parks are becoming more and more crucial to the conservation of insect biodiversity. The current study records the species composition and diversity of butterflies in Lumbini Butterfly Park in Gundgurti, Kalaburagi District, Karnataka, India. To create a thorough checklist and evaluate the park's species representation by family, systematic field surveys were carried out.

During the research period, 51 species from five families were identified. Nymphalidae was the most prevalent family among those recorded, accounting for 35.53% of the overall species richness. With each family representing 27.45% of the species found, Pieridae and Lycaenidae demonstrated similar representation. Riodinidae was the least represented family, making up only 0.66% of all species, whereas Hesperiidae accounted for 5.88% of all species. Given their ecological flexibility and broad host plant range, the observed dominance of Nymphalidae is in line with patterns documented from other urban and semi-urban settings in peninsular India.

The results demonstrate the ecological value of Lumbini Butterfly Park as a haven for the variety of butterflies found in the Kalyana, Karnataka region. The study highlights the significance of planned urban habitats in sustaining Lepidopteran variety and offers baseline data for long-term

monitoring. Additional species richness in the park might be achieved by ongoing habitat management and host and nectar plant diversity.

**Keywords:** Butterfly diversity, species composition, urban biodiversity, Nymphalidae, Kalaburagi, Karnataka.

## 1. INTRODUCTION:

The sensitivity of butterflies (Order Lepidoptera) to changes in their habitat, phenological changes, and the availability of resources has led to their widespread recognition as important indicators of ecosystem health (Pollard & Yates 1993; referenced in Attiwilli *et al.,* 2021). As pollinators and ecological sentinels, butterflies are essential to many terrestrial ecosystems, especially urban and semi-urban green spaces, where they aid in plant reproduction and provide information on biodiversity status (Kunte 2000; NCBS News 2026).

With about 1,500 butterfly species and a variety of climatic zones and floral diversity, India is an important place to study lepidopteran biodiversity (Varshney & Smetacek 2015; cited in Kunte 2000). Although there are comprehensive checklists for a number of India's protected and semi-natural landscapes, like those in Delhi (Biswas 2024) and Kerala (Vijithra & Zeena 2025), urban butterfly parks and planned green areas are still not well studied scientifically. The establishment of butterfly parks, legal safeguards and conservation campaigns has all helped to raise awareness of butterfly conservation in India. By offering necessary resources like host plants for caterpillars and nectar sources for adult butterflies, these parks are intended to replicate natural butterfly habitats. As an illustration of the efficacy of such conservation measures, a research carried out at the Kerala Forest Research Institute, Peechi, Thrissur showed that the introduction of certain flora resulted in a significant rise in butterfly populations (Mathew *et al.,* 2011). In the context of ecotourism, butterfly parks draw tourists and environment lovers, bringing in money for nearby towns. Incorporating ecotourism within these parks highlights the cultural and biological significance of preserving these areas while also boosting local economy (Mathew *et al.,* 2011). Butterfly farming projects have been economically successful, increasing livelihood opportunities and promoting conservation behavior (Checa *et al.,* 2023). The Butterfly Park at Bengaluru's Bannerghatta Biological Park was created by the Department of

Biotechnology and the Karnataka Zoo Authority with an emphasis on public education, research, and conservation. It was inaugurated on 25th November 2006. Visitors' ecological literacy is greatly enhanced by such programs (Basavarajappa *et al.,* 2018).

## 2. Materials and Methods:

### 2.1 Study Area

Gundagurti is a small village located in Chittapura taluka and is 12.8 kilometers away from Chittapur's bus depot. It is situated on the SH 10-Ribbanapalli to Wagdhari route. It is around 24 kilometers away from Kalaburagi, the district headquarters. You may take a bus to get there. Kalaburagi Airport is the closest airport, located 15 kilometers away. Meanwhile, Kalaburagi railway station is the closest railway station, 25 kilometers away.

Lumbini Tree Park, situated in Gundgurti Village, includes Lumbini Butterfly Park situated in Survey No. 371 of Gundagurti Village. The tree park spans 6.92 hectares and is a component of the Gundagurti Deemed Forest area. The GPS location of the tree park is 17.2478475° N and 77.0564901°E. It is the first of its kind tree park in the whole Chittapura taluka. It was inaugurated on January 26th 2025 by the cabinet minister Shri Priyank Kharge (Minister for Information Technology and Biotechnology Government of Karnataka). Initially there was no plan of setting up of Butterfly Park in the tree park. This was made possible by the vision of Mr. Vijaykumar Badiger, Range Forest Officer, Chittapur Forest Range. When RFO Mr. Vijaykumar Badiger reached out to us, we happily agreed to collaborate with the Karnataka Forest Department and gave a helping hand in creating this beautiful butterfly park. This park's distinctive feature is that it precisely resembles a butterfly anytime someone views it from a drone or bird's eye. The butterfly park was planted with a variety of host plant and nectar plant after receiving information from other butterfly parks.

### 2.2 Survey Period and Timing

Field surveys were conducted over a one-year period, from January to December 2025, to encompass seasonal variation in butterfly presence and activity. Observations were carried out during the peak flight hours of butterflies between 08:00 and 12:00 h, when adults are most

active for nectar foraging and mating (Pollard Walk method; adapted from Parmar & Dhar 1995; Attiwilli *et al*., 2021).

### 2.3 Sampling Methods

Butterflies were recorded using the Pollard Walk Method, a standardized line-transect approach widely used in lepidopteran surveys (Pollard & Yates 1993; adapted from Attiwilli *et al*., 2021). A fixed transect of 500 m was established along predefined park routes that encompassed varied vegetation types. Observers walked the transect at a steady pace, recording all butterflies observed within a 5 m corridor (2.5 m each side and 5 m ahead). This method allows estimates of species richness, relative abundance, and temporal activity patterns.

### 2.4 Identification and Taxonomy

Field identifications were made using standard Indian butterfly field guides (e.g., Kunte 2000) and online resources such as *Ifoundbutterflies.org*. Voucher photographs were taken for each species, and specimens difficult to identify in the field were referenced against museum collections or expert validations when possible. Taxonomy and nomenclature followed the most recent systematic checklists available for Indian butterflies (Varshney & Smetacek 2015; synonym databases such as Savela 2025).

## 3. Results:

In five families, Lumbini Butterfly Park has 51 species. With 35.53% of the species in Joida Park, the Nymphalidae family is the most prominent, while the Hesperidae family is the least dominant with 0.66% of the species. The families Nympalidae, Pieridae, and Lycaenidae all have comparable percentage compositions of species in Lumbini Park (27.45%), whereas Hesperidae is the least prevalent family (5.88% of total species).

## 4. Conclusion:

The current study highlights the significance of Lumbini Butterfly Park, Gundgurti, as an urban biodiversity hotspot in Kalaburagi District by documenting a total of 51 butterfly species from five families. While the low number of Hesperiidae offers room for habitat enrichment, the dominance of

Nymphalidae and the moderate representation of Pieridae and Lycaenidae indicate excellent habitat conditions and the availability of host and nectar plants inside the park. All things considered, the results demonstrate Lumbini Butterfly Park's importance as a haven for Lepidopteran variety in the Kalyana Karnataka region and offer crucial baseline data for upcoming monitoring, conservation planning, and habitat management projects.

## 5. Acknowledgement:

I sincerely express my profound gratitude to Dr. K. Vijaykumar, Senior Professor (Rtd) Department of PG Studies and Research in Zoology, Gulbarga University, Kalaburagi–585106, Karnataka, for his constant support, valuable guidance, and continuous inspiration in undertaking and successfully carrying out this research work. His encouragement, scholarly insight, and constructive suggestions have been instrumental in shaping the direction and completion of this study.

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I extend my special thanks to Sumitkumar Patil, IFoS, and Vijaykumar Badiger, Range Forest Officer, Chittapur Forest Range, for being the major driving force behind the establishment of the butterfly park in the Kalyana Karnataka region. His vision, dedication, and efforts have significantly contributed to the development and conservation value of this unique ecological space.

**Table 1: showing checklist of Butterflies in Lumbini Butterfly Park,Gundgurti Kalaburagi, Karnataka**

| Serial number | Scientific name | Common name |
|---|---|---|
| **Family – Hesperidae (Skippers)** | | |
| 1 | *Hasora chromus* (Cramer, 1780) | Common Banded Awl |
| 2 | *Pelopidads subochracea* (Moore, 1878) | Large Branded Swift |
| 3 | *Pelopida mathias* (Fabricius, 1798) | Small Branded Swift |
| **Family –Lycaenidae (Blues)** | | |
| 4 | *Euchrysops cnejus* (Fabricius, 1798) | Gram Blue |
| 5 | *Spindasis vulcanus* (Fabricius, 1775) | Common Silverline |
| 6 | *Leptotes plinius* (Fabricius, 1793) | Zebra Blue |
| 7 | *Castalius rosimon* (Fabricius, 1775) | Common Pierrot |
| 8 | *Talicada nyseus* (Guerin-Meneville, 1843) | Red Pierrot |
| 9 | *Catochrysops Strabo* (Fabricius, 1793) | Forget Me Not |
| 10 | *Zizula hylax* (Fabricius, 1775) | Tiny Grassblue |
| 11 | *Zizina otis* (Fabricius, 1787) | Lesser Grassblue |
| 12 | *Zizzeria karsandra* (Moore, 1865) | Dark Grassblue |
| 13 | *Freyeria putli* (Kollar, 1844) | Oriental Grass Jewel |
| 14 | *Azanus ubaldus* (Stoll, 1782) | Bright Babulblue |
| 15 | *Azanus jesous* | African Babulblue |
| 16 | *Everes lacturnus* (Godart, 1824) | Indian Cupid |
| 17 | *Jamides celeno* (Cramer, 1775) | Common Cerulean |
| **iii ) Family Nymphalidae (Brush Footed Butterflies)** | | |
| 18 | *Mycalesis perseus* (Fabricius, 1775) | Common Bushbrown |
| 19 | *Danaus genutia* (Cramer,1779) | Striped Tiger |
| 20 | *Danaus chrysippus* (Linnaeus, 1758) | Plain Tiger |
| 21 | *Tirumala limniace* (Cramer, 1775) | Blue Tiger |

| | | |
|---|---|---|
| 22 | *Euploea core* (Cramer, 1780) | Common Crow |
| 23 | *Melantis leda* (Linnaeus, 1758) | Common Evening Brown |
| 24 | *Ypthima asterope* (Klug, 1832) | Common Three Ring |
| 25 | *Acraea terpsicore* (Linnaeus, 1758) | Tawny Coster |
| 26 | *Ariadne ariadne* (Linnaeus, 1763) | Angled Castor |
| 27 | *Byblia ilithyia* (Drury, 1773) | Joker |
| 28 | *Junonia orithya* (Linnaeus, 1758) | Blue Pansy |
| 29 | *Junonia lemonias* (Linnaeus 1758) | Lemon Pansy |
| 30 | *Hypolimnas misippus* (Linnaeus, 1764) | Danaid Eggfly |
| 31 | *Hypolimnas bolina* (Linnaeus, 1758) | Great Eggfly |
| **ⅳ) Family Pieridae (Whites and Yellows)** | | |
| 32 | *Eurema hecabe* (Linnaeus, 1758) | Common Grass Yellow |
| 33 | *Eurema blanda* (Boisduval, 1836) | Three Spot Grass Yellow |
| 34 | *Eurema laeta* (Boisduval, 1836) | Spotless Grass Yellow |
| 35 | *Catopsilia pyranthe* (Linnaeus, 1758) | Mottled Emigrant |
| 36 | *Catopsilia pomona* (Fabricius, 1775) | Common Emigrant |
| 37 | *Leptosia nina* (Fabricius, 1793) | Psyche |
| 38 | *Pereronia hippie* (Fabricius, 1787) | Common Wanderer |
| 39 | *Colotis danae* (Fabricius, 1775) | Crimson Tip |
| 40 | *Colotis aurora* (Cramer, 1780) | Plain Orange Tip |
| 41 | *Ixias pyrene* (Linnaeus, 1764) | Yellow Orange Tip |
| 42 | *Ixias Marianne* (Cramer, 1779) | White Orange Tip |
| 43 | *Cepora nerissa* (Fabricius, 1775) | Common Gull |
| 44 | *Benois aurota* (Fabricius, 1793) | Pioneer |
| 45 | *Delia eucharis* (Drury, 1773) | Common Jezebel |
| **ⅴ) Family Papilionidae (Swallowtails and Birdwings)** | | |
| 46 | *Graphium agamemnon* (Linnaeus, 1758) | Tailed Jay |
| 47 | Graphium doson (C. &R.Felder, 1864) | Common Jay |
| 48 | *Pachliopta aristolochiae* (Fabricius, 1775) | Common Rose |
| 49 | *Pachliopta hector* (Linnaeus, 1758) | Crimson Rose |

| | | |
|---|---|---|
| 50 | *Papilio polytes* (Linnaeus, 1758) | Common Mormon |
| 51 | *Papilio demoleus* (Linnaeuus, 1758) | Lime Butterfly |

**Table 2: Family wise distribution of butterflies in Lumbini butterfly Park, Gundgurti**

| **Sl No.** | **Family** | **No. of Species Recorded** |
|---|---|---|
| 1 | Hesperiidae (Skippers) | 03 |
| 2 | Lycaenidae (Blues) | 14 |
| 3 | Pieridae (Whites and Yellows) | 14 |
| 4 | Nymphalidae (Brush-footed butterflies) | 14 |
| 5 | Papilionidae (Swallowtails) | 6 |
| **Total-51** | | |

**Figure 1: Graph showing number of butterfly species recorded at Lumbini Park.**

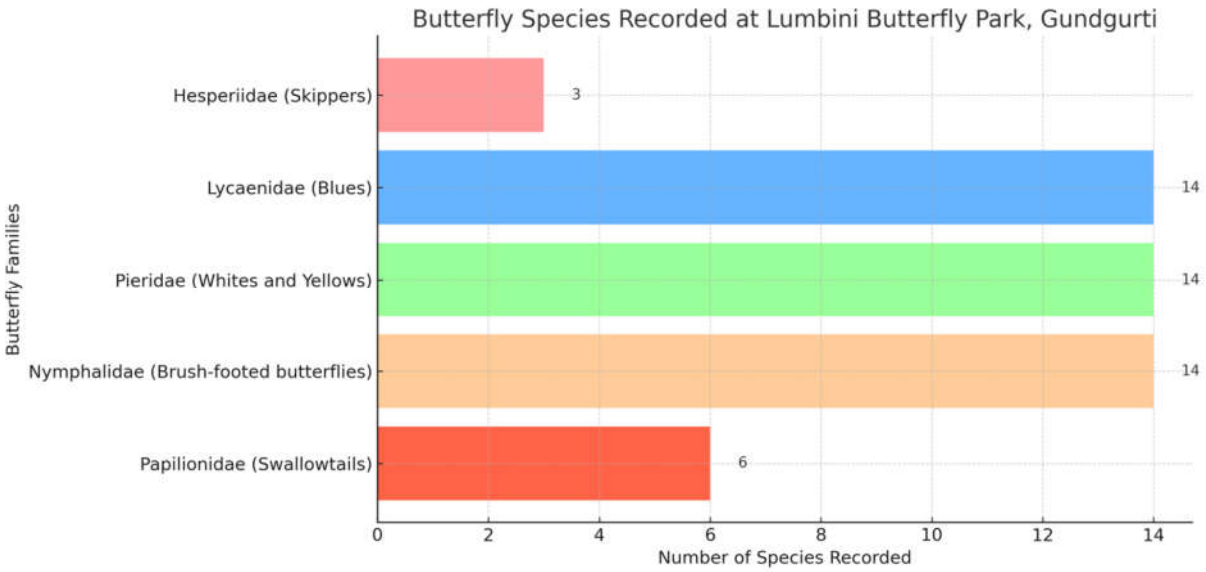

**Figure 2-Photos of Lumbini Butterfly Park**

## 6. References:


- Attiwilli, S., Nitin, R. & Kunte, K. (2021). *Comparison of butterfly sampling methods in India*; time-constrained counts vs belt transects. Indian Butterfly Monitoring Scheme Report. NCBS News (2026).
- Biswas, S. (2024). *Updated checklist: Butterflies of Delhi, India, with new additions*. *Int. Journal of Zoological Sciences*.
- Kunte, K. (2000). *Butterflies of Peninsular India*. Universities Press, Hyderabad. (standard taxonomic guide)
- Varshney, R.K. & Smetacek, P. (2015). *A Synoptic Catalogue of the Butterflies of India*. (authoritative Indian checklist)
- Vijithra, A. & Zeena, K.V. (2025). *A checklist of butterflies in Karulai, Malappuram District, Kerala, India*. *Uttar Pradesh Journal of Zoology* 46(11):298–304**.**
- 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(9), 432-443.
- Checa, M. F., Rosero, P., de Goulaine, M., & Schmink, M. (2024). Butterfly farming for promoting sustainability and ecotourism: a case study of feasibility in Western Ecuador. Tropical Lepidoptera Research, 29-39.
- Pollard, E. and T. J. Yates. 1993. Monitoring butterflies for ecology and conservation: The British butterfly monitoring scheme. Institute of terrestrial ecology and joint nature conservation committee. Chapman & Hall. UK. Pp. 1-274.
- Mathew, G., George, E., & Anto, M. (2011). Role of Butterfly gardens in promoting biodiversity conservation and ecotourism. ENVIS Bulletin: Wildlife and Protected Areas-Athropods and their conservation in India (Insects and Spiders) Vol, 14, 87-97.