I J C R M
International Journal of Contemporary Research In Multidisciplinary

Review Article

Studies on Butterfly Population in Some Urban Habitats at Lucknow, Uttar Pradesh, India

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DOI: https://doi.org/10.5281/zenodo.18360253

Abstract

The butterflies were observed during daytime hours, collections were also made using a sweep net, and the collected specimens were dry preserved following Arora (1990) and deposited in the museum of the Department. Identification of species was done using available literature (Kunte, 2000; Antram, 2002; Palot et al., 2003; Wynter-Blyth, 1957; Gunathilagaraj et al., 1998). Species classification and scientific names are as per Gunathilagaraj et al., 1998; Varshney, 1994, 1997. In the study, 810 butterflies belonging to five families were recorded. Among these families, the Nymphalidae were dominant with 12 species, followed by Pieridae (11), Lycaenidae (10), Papilionidae (3) and Danaidae (3).

Manuscript Information

- **ISSN No:** 2583-7397
- **Received:** 11-08-2025
- **Accepted:** 29-09-2025
- **Published:** 30-10-2025
- **IJCRM:**4(5); 2025: 601-605

- **Plagiarism Checked:** Yes
- **Peer Review Process:** Yes

How to Cite this Article

Kumar A. Studies on Butterfly Population in Some Urban Habitats at Lucknow, Uttar Pradesh, India. Int J Contemp Res Multidiscip. 2025;4(5):601-605.

Access this Article Online

www.multiarticlesjournal.com

KEYWORDS: Butterfly diversity, Urban habitats, Lepidoptera, Species composition, Biodiversity conservation

1. INTRODUCTION

Butterflies are among the most easily recognizable of all animals. They are instantly familiar and also universally popular. Their wings, unlike those of most other insects, are colorful, opaque and are of characteristic shape. The development of color the range, diversity, brilliance and kaleidoscopic assortment of patterns exhibited by butterflies is unrivalled anywhere in the animal's kingdom, except possibly by the birds.

Biological diversity is not homogeneously distributed on the Earth's surface, and an understanding of the distribution patterns of organisms is crucial in making effective decisions in conservation action. Some habitats, such as coral reefs and tropical rainforests

Butterflies have been studied systematically since the early 18th century, and 19,238 species have been documented worldwide (Heppner, 1998). This figure is not constant because of the continuous discovery of new butterflies (Stokoe, 1974; Goodden, 1997; Green and Huang, 1998; Barua et al, 2004; Ambrose et al, 2005; Alphonsa Xavier, 2006; Chandra et al, 2007; Parag and Omkar 2009; Kumar, 2011), and also due to ongoing disagreements between taxonomists over the status of many species. The distribution of butterflies involves both expanding and contracting ranges, but natural changes in the distribution of species can be difficult to deduce because they tend to be slower and subtler than the dramatic changes caused by man. Singh (2009) recorded a total of 3617 individuals of 147 species of butterflies during eleven sampling surveys carried out in Kedarnath Musk Deer Reserve, Garhwal Himalaya. Butterflies were abundant from late April to September.

Verma (2009) recorded altogether 39 species of butterflies belonging to 4 families. Maximum diversity was observed during the last weeks of winter and during spring, while a comparatively low diversity was observed during the rainy seasons. The maximum number of butterflies was observed during spring and at the height of winter. Species richness showed a reduction at the end of the rainy season (September) and during the warmest part of summer (April to May). The butterflies (Order: Lepidoptera) are cosmopolitan but are not yet well studied in the tropical andern region, due to their taxonomic complexity, morphological homogeneity and frequent restriction to remote, high elevation regions (Huertas 2004; Pena & lamas 2005; Wahberg et al. 2005; Pyrez & Viloria 2007). Nonetheless, the satyrinae have recenty become a focus of research attention as a proposed ecological indictor group (Huertas 2004) and the subject of the molecular phylogenetic studies (Pena et al. 2006). These studies and others have led progressively to an increase in our knowledge of the taxonomy, biology and phylogenetic relationship of the group and, more recently, the description of several new taxa (Viloria & Pyrez 2000; Pyrez 2004; Pena & Lamas 2005; Freitas & Pena 2006; Pyrez 2006). In the universe, butterfly is regarded as one of the most well taxonomically and ecologically studied group of insects belonging to the order Lepidoptera (Kumar and Rana,2018; Kumar,2017; Priyansietal. 2023; Sushmita etal,2021; 2022. Rangnekar and Dharwadkar (2009) encountered three species not recorded previously from Goa, which takes the total number of butterflies recorded from the state to 254 species. The three species are recorded in the fauna of Goa. These are Black-vein Sergeant (*Athyma ranga*) in family Nymphalidae, White-banded Awl (*Hasora taminatus*) in family Hesperiidae and Coon (*Psolos fuligo*) in family Hesperiidae. Kumar (2011) recorded a total of 655 individuals of 23 species of butterflies during a survey carried out in four study sites of Jhansi. Individuals of Pieridae and species of Nymphalidae were abundant during the study.

2. MATERIALS AND METHODS

The study was carried out in a chosen area, namely PDDP- Pt. Deen Dyal Park, RR Raebareli Road, VY Vridavan Yojna and SGPGI Snajay Gandhi Post Graduate Institute. These sites were selected on the basis of their position in vegetation and accessibility. Pt Deen Dyal Park. This is basically a on Road Park and an exhibition ground regarding the flowering, ornamental & medicinal plants; the exhibition is organised by the state government from time to time. On visiting the exhibition, you find different types of vegetables, fruits and flowers. Raebereli Road Study area from SGPGI to Mohanlal Ganj, both sides of the road have flowering plants (cultivated, semi-wild and wild), so many butterflies were seen throughout the day. Vrindavan Yojna, the Geographical position of this site is at east side of Lucknow. The site shows varying forms of flowing garden, semi-wild plants, and a big water body. Snajay Gandhi Post Graduate Institute. located in opposite side of Vridavan Yojna, possesses an open field and parks, there are different types of shrubs, herbs, flowing and ornamental plants on this side, which support a wide variety of butterfly species.

The survey for butterflies was carried out by making an interval of 2 or 3 days in the morning (8-10 AM) and evening (4-5 PM) from February 2021 to January 2022 to document the butterfly diversity in the study sites. Collections were also made using a sweep net, and the collected specimens were dry preserved following Arora (1990) and deposited in the Zoology Museum. And collected butterflies were also photographed as and when possible. Identification of species was done using available literature (Gunathilagaraj et al., 1998; Kunte, 2000; Antram, 2002; Palot et al., 2003) and with the help of experts. Species classification and scientific names as per Gunathilagaraj et al., 1998. Butterflies observed were categorised into five groups (VC-very common, C- common, O- occasional, R- rare and VR- very rare) based on their occurrence during the period of study.

3. RESULTS AND DISCUSSION

A total of 810 individuals of 39 species of butterflies belonging to 30 genera, distributed over five families, were detected from the monitoring sites during the study period. As per study the family Nymphalidae dominated with 12 species, Atella phalanta, Precis lemonias, Precis orithya, Precis hierta, Tirumala limniace, Hypolimnas missipus, Danaus genutia, Danaus chrysippus, Junonia atlites, Ariadne merione, Melanitis

idea, Hypolimnas bolina followed by Pieridae (11 species, Ixias Marianne, Catopsilia pyranthe, Colotis amata, Eurema brigitta, Colotis etrida etrida, Pieris rapae, Terias hecabe simulate, Catopsilia crocale, Belonois aurota, Cepora nerissa, Colotis fausta), Lycaenidae (10 species, Chilades contracta, Castalius rosimom, Zizina otis, Pseudozizeeria maha, Everes lacturnus, Chilades parrhasius, Pratapa deva, Catochrysops strabo, Lampides boeticus, Tarucus extricatus) Papilionidae and Danaidae (3 species each Papilio demoleus, Atrophaneura aristolochiae, Papilio polytes romulus and Danaus chrysipus, Danaus genuita, Euploea core core respectebly (Table 1&2). Similar hierarcy pattern have also been reported from Parambikulam Wildlife Sanctuary by Sudheendrakumar et al. (2000); Kumar (2011).

Subsequent monumental works and fauna volumes include several species from Madhya Pradesh and Chhattisgarh (Evans, 1932; Talbot, 1939, 1947; Wynter-Blyth, 1957). In the recent past, several workers have studied butterflies from some districts and conservation areas of Madhya Pradesh and Chhattisgarh (Chandra et al., 2002; 2007). The compilation of these studies and stray records results in the enumeration of 39 species belonging to 30 genera spread over five families (Table-1&2). Of the total butterfly species, 38, 34, 35 and 33 species are represented from Narayan bagh, Orchha Road, Parichha dam and Bundelkhand Institute of Engineering Technology, respectively, and 23 species are common to all sites (Table-1). Among the Lepidoptera, the family Papilionidae contains about 700 species distributed throughout the world (Smart, 1975). One hundred and seventy species of butterflies were recorded in Northern Assam by Betts (1951), who reported 70 species of butterflies from Bombay and Salssetter. In the Indian Ocean region (including India, Pakistan, Ceylon, Burma, Andaman and Nicobar Islands) About 1,400 species have been found, including some of the most beautiful in the world (Wynter-Blyth, 1957). Sathyamurthi (1966) has catalogued the butterflies of the Madras Museum with reference to their morphology and habits, a very useful guide to the butterfly fauna in the southern states. Chaturvedi and Satheesan (1980) reported 140 species of butterflies. The Zoological Survey of India conducted several faunistic surveys in the unexplored areas of Silent Valley (1979-80). According to Chaturvedi and Satheesan (1980), the Indian subcontinent alone has over 1,443 species of butterflies.

Butterflies are typically active during the day, and because they are so skilled in flight, they have achieved an almost worldwide distribution, though, as with most animal groups. There is a greater diversity to be found in the tropics. Unfortunately, butterflies are threatened by habitat destruction and fragmentation almost everywhere (Mathew, 2001).

Many butterflies occupy vast ranges, covering parts of Europe, Africa, Asia and Australia. As part of their adaptation to survive in the varied environments they inhabit, one often finds that the same butterfly species looks quite different in different parts of its range. Such different forms, called geographical variations or subspecies, are usually named to facilitate reference to them. Extensive studies on butterflies of Western Ghats, Southern India, were carried out by Goenkar (1996), including the first study that took into account all 330 species in 166 genera, belonging to 5 families, recorded from this mountain range and the adjacent areas. An Intensive Survey Of Nilgiris And Its Environs By Gunathilagaraj Et. Al (1997) revealed 104 Species Of butterflies.

Table 1: Taxonomic Composition and Population of Butterflies Recorded from Some Urban Sites in Lucknow

S.No.	Species/family	Common name	PDDP	RR	VY	SGPGI	Remarks
	Family: Nymphalidae						
1	Atella phalanta	Common leopard	5	2	1	1	R
2	Precis lemonias	Lemon pansy	2	1	5	2	R
3	Precis orithya	Blue pansy	2	4	1	9	O
4	Precis hierta	Yellow pansy	2	1	–	1	R
5	Tirumala limniace	Blue tiger	3	3	2	6	C
6	Hypolimnas missipus	Danaid eggfly	3	2	1	-	R
7	Danaus genutia	Striped tiger	5	2	4	7	C
8	Danaus chrysippus	Plain tiger	10	3	6	3	O
9	Junonia atlites	Grey pansy	2	3	2	4	R
10	Ariadne merione	Common castor	1	–	2	1	VR
11	Melanitis ieda	Common evening brown	–	1	3	2	VR
12	Hypolimnas bolina	Great eggfly	3	2	1	1	R
	Family: Pieridae						
13	Ixias marianne	White orange tip	31	15	29	30	VC
14	Catopsilia pyranthe	Mottled emigrant	1	4	3	2	C
15	Colotis amata	Small salmon arab	2	2	1	1	R
16	Eurema brigitta	Small grass yellow	76	60	35	70	VC
17	Colotis etrida etrida	Small orange tip	22	12	11	8	VC
18	Pieris rapae	Small white	1	–	2	1	R
19	Terias hecabe simulata	Common grass yellow	1	-	1	-	VR
20	Catopsilia crocale	Common emigrant	6	1	3	4	C
21	Belonois aurota	Pioneer	14	4	2	3	O
22	Cepora nerissa	Common gull	5	6	10	7	C
23	Colotis fausta	Large salmon arab	1	3	1	1	C

	Family: Lycaenidae						
24	Chilades contracta	Small cupid	7	2	2	3	O
25	Castalius rosimom	Common pierrot	3	2	1	1	R
26	Zizina otis	Lesser grass blue	3	–	2	6	R
27	Pseudozizeeria maha	Pale grass blue	1	1	2	-	VR
28	Everes lacturnus	Indian cupid	3	2	1	1	R
29	Chilades parrhasius	Small cupid	1	1	-	-	VR
30	Pratapa deva	White royal	2	2	1	2	R
31	Catochrysops strabo	Forget me not	2	1	–	4	R
32	Lampides boeticus	Pea blue	1	2	–	7	R
33	Tarucus extricatus	Rounded pierrot	3	–	1	2	R
	Family: Papilionidae						
34	Papilio demoleus	Lime butterfly	3	2	5	4	C
35	Atrophaneura aristolochiae	Common rose	1	2	1	1	VR
36	Papilio polytes romulus	Common mormon	3	1	2	1	R
	Family: Danaidae						
37	Danaus chrysipus	Common tiger	1	2	3	1	R
38	Danaus genuita	Striped tiger	2	2	1	1	R
39	Euploea core core	Common Indian crow	3	6	21	6	O

PDDP- Pt.deen dyal Park **RR Raebareli Road** VY **Vridavan Yojna,** **SGPGI** Snajay Gandhi Post Graduate Institute **VC** -Very common
C-Common
O- Occasional
R - Rare
VR- Very rare

Table 2. Number Of Individuals, Genera and Species of Different Families

S. No.	Family	Number of individuals	No. of genera/species
1	Nymphalidae	170	9/12
2	Pieridae	490	8/11
5	Lycaenidae	75	9/10
4	Papilionidae	25	2/3
5	Danaidae	50	2/3
	TOTAL	810	30/39

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