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# Checklist of Butterflies from the Botanical Garden, Lahore

**Rimsha and Ishrat Aziz***
Department of Biological Sciences, Virtual University of Pakistan

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**Abstract.** The butterfly house at the botanical garden in Lahore, Punjab, Pakistan, serves as a sanctuary for a diverse array of butterfly species. This study was conducted from September 2022 to May 2023, focusing on the butterfly species present in this sanctuary. A total of 24 species from three families Papilionidae, Pieridae and Nymphalidae were identified using standard identification literature. Specifically, 13 species belonged to the Nymphalidae family, 7 to Pieridae and 4 to Papilionidae. Nymphalidae was the most represented family, constituting 54% of the species diversity, followed by Pieridae (29%) and Papilionidae (17%). Notably, rare species such as the common blue bottle, common crow, paper kite, common windmill and chocolate pansy were observed. This research represents the first checklist of butterfly fauna in the Lahore botanical garden and underscores the need for further studies to comprehensively document the area's butterfly biodiversity. This information is crucial for monitoring ecological trends and habitat conditions.

**Keywords:** butterfly species, butterfly house, botanical garden, checklist, Lepidoptera

## Introduction

Butterflies, belonging to the order Lepidoptera, among the most recognized and studied insects worldwide. Globally, over 28,000 butterfly species have been documented with approximately 80% residing in tropical regions (Khan *et al*., 2015). In Pakistan, there are about 5000 insect species, including around 400 species of moths and butterflies (Attaullah *et al*., 2018; Khan *et al*., 2007).

The term "Lepidoptera" was coined by Linnaeus (1758), derived from the Greek words for scale-covered wings (van Nieukerken *et al*., 2011). Butterflies are celebrated for their aesthetic appeal and ecological importance, serving as pollinators and bioindicators. They are sensitive to environmental changes, making them excellent indicators of ecosystem health (Murphy *et al*., 1990).

Butterflies exhibit vibrant colors and intricate patterns on their wings, which serve various functions, including mate attraction and predator deterrence. Their life cycle consists of four stages: egg, larva (caterpillar), pupa (chrysalis) and adult. As adults, butterflies primarily feed on nectar, playing a vital role in pollination. They are also integral to the food web, serving as prey for various predators (Dayananda, 2014).

This study aims to document the butterfly species present in the butterfly house at the botanical garden in Lahore, Punjab, Pakistan. The garden, managed by the parks and horticulture authority (PHA), provides a conducive environment for butterflies, supported by a diverse collection of host plants.

*Author for correspondence; E-mail: ishrat.aziz@vu.edu.pk

## Materials and Methods

**Study area.** The study was conducted at the Lahore botanical garden, located approximately 20 Km east of Lahore, covering an area of 461 acres (187 hectares). Punjab, the most agriculturally productive province in Pakistan, provided a suitable backdrop for this study as shown in Fig. 1.

**Collection and identification.** Butterflies, belonging to the order Lepidoptera, are among the most recognized and studied insects worldwide. They are important ecological indicators and play vital roles in pollination. The Botanical Garden, managed by the Parks and Horticulture Authority (PHA), Lahore, provides a conducive environment for butterflies supported by a diverse collection of host and nectar plants. The present checklist documents the butterfly species observed in this garden. Butterfly specimens were observed and photographed between September 2022 and May 2023. Identification was made using display information at the garden and confirmed by published literature (Abbas et al., 2002; Evans, 1932). Some species were reportedly imported from abroad; however, according to staff, these specimens did not survive. This is the first checklist of butterflies recorded from the Botanical Garden, Lahore.

## Result and Discussion

This is first study of butterfly checklist of botanical garden, Lahore. Twenty-four species belonged to 17 genera of three families namely Papilionidae, Pieridae and Nymphalidae were recorded. The list of families and sub families reported in Table 1. The species scientific names, common names and figures reported in Table 2. The richness percentage was shown in Fig. 2.

This study represents the first comprehensive checklist of butterfly species in the Botanical Garden, Lahore. Previous studies in other regions of Punjab, such as Rawalpindi and Islamabad, have documented a variety of butterfly species (Hassan, 1997, 1994; Ahsan and Iqbal, 1975). This study adds to the growing body of knowledge on Pakistan's butterfly fauna, particularly in urban and peri-urban settings.

The findings align with earlier research, noting the presence of species such as *Colias fieldii*, *Catopsilia pyranthe* and *Papilio demoleus*, which are common across different regions (Khan *et al*., 2007). The diversity observed in the botanical garden suggests the present study contributes the valuable data to the understanding of butterfly diversity in Pakistan. The presence of 24

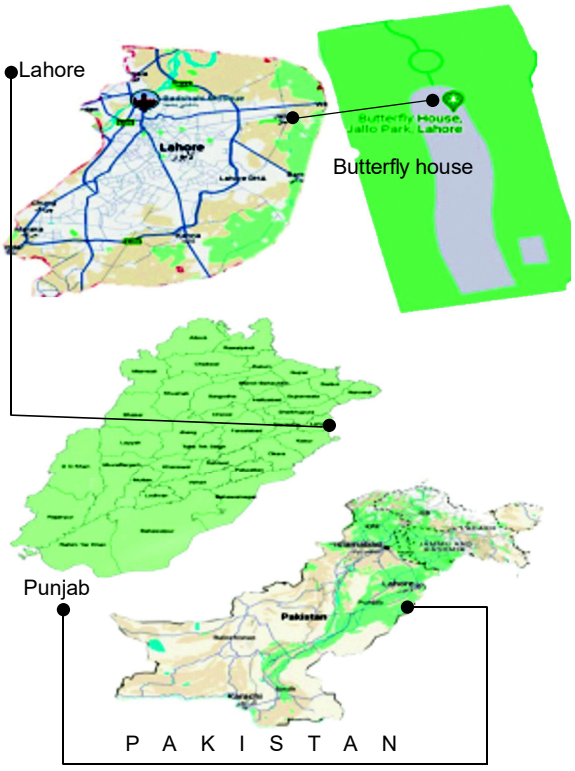
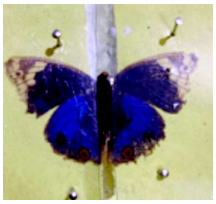
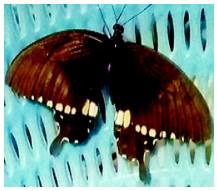



**Fig. 1.** Study area map, source; google map.

**Table 1.** List of present species from botanical garden with families and subfamilies

| Family | Subfamily | Genus | Species | Common name |
|---|---|---|---|---|
| Nymphalidae | Danainae | *Danaus* | *Danaus genutia* | Common tiger |
| | Danainae | *Danaus* | *Danaus chrysippus* | Plain tiger |
| | Danainae | *Tirumala* | *Tirumala limniace* | Blue tiger |
| | Danainae | *Euploea* | *Euploea core* | Common crow |
| | Nymphalinae | *Junonia* | *Junonia iphita* | Chocolate pansy |
| | Nymphalinae | *Junonia* | *Junonia orithya* | Blue pansy |
| | Nymphalinae | *Junonia* | *Junonia hierta* | Yellow pansy |
| | Nymphalinae | *Junonia* | *Junonia almana* | Peacock pansy |
| | Nymphalinae | *Vanessa* | *Vanessa cardui* | Painted lady |
| | Nymphalinae | *Hypolimnas* | *Hypolimnas misippus* | Danaid eggfly |
| | Nymphalinae | *Hypolimnas* | *Hypolimnas bolina* | Great eggfly |
| | Heliconiinae | *Argynnis* | *Argynnis hyperbius* | Indian fritillary |
| | Danainae | *Idea* | *Idea leuconoe* | Paper kite |
| Papilionidae | Papilioninae | *Papilio* | *Papilio polytes* | Common mormon |
| | Papilioninae | *Papilio* | *Papilio demoleus* | Lemon butterfly |
| | Papilioninae | *Byasa* | *Byasa polyeuctes* | Common windmill |
| | Papilioninae | *Graphium* | *Graphium sarpedon* | Common bluebottle |
| Pieridae | Coliadinae | *Eurema* | *Eurema hecabe* | Common grass yellow |
| | Pierinae | *Pieris* | *Pieris brassicae* | Cabbage butterfly |
| | Coliadinae | *Colias* | *Colias fieldii* | Dark clouded yellow |
| | Pierinae | *Delias* | *Delias eucharis* | Common jezebel |
| | Pierinae | *Belenois* | *Belenois aurota* | Pioneer |
| | Coliadinae | *Catopsilia* | *Catopsilia pomona* | Common emigrant |
| | Coliadinae | *Catopsilia* | *Catopsilia pyranthe* | Mottled emigrant |

**Table 2.** List of present species with their scientific names, common names and figures

| Species | Common name | Figures |
|---|---|---|
| *Danaus genutia* | Common tiger |  |
| *Danaus chrysippus* | Plain tiger |  |
| *Tirumala limniace* | Blue tiger |  |
| *Junonia orithya* | Blue pansy |  |
| *Junonia almana* | Peacock pansy |  |
| *Vanessa cardui* | Painted lady |  |
| *Hypolimnas misippus* | Danaid eggfly |  |
| *Hypolimnas bolina* | Great eggfly |  |
| *Papilio polytes* | Common mormon |  |
| *Papilio demoleus* | Lemon butterfly |  |
| *Byasa polyeuctes* | Common windmill |  |
| *Catopsilia pomana* | Common emigrant |  |
| *Catopsilia pyranthe* | Mottled emigrant |  |
| *Belenois aurota* | Pioneer |  |
| *Argynnis hyperbius* | Indian fritilliary |  |

*Continued on next page*

| Species | Common name | Figures |
|---|---|---|
| *Catopsilia pomona* | Common emigrant (female) |  |
| *Delias eucharis* | Common jezebel |  |
| *Graphium sarpedon* | Common bluebottle |  |
| *Colias fieldii* | Dark clouded yellow |  |
| *Pieris brassicae* | Cabbage butterfly |  |
| *Euploea core* | Common crow |  |
| *Eumera hecabe* | Common grass yellow |  |

species from three families-Nymphalidae, Pieridae and Papilionidae-demonstrates the garden's rich butterfly fauna. Fig. 2 similar studies across the globe underscore

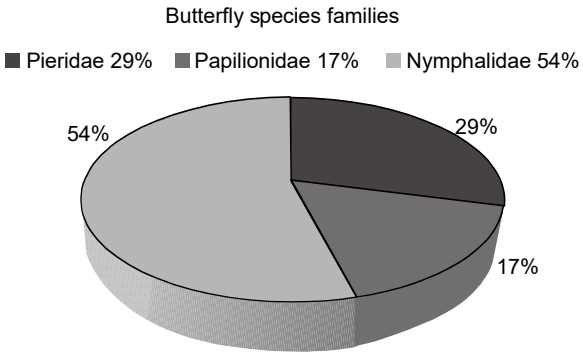



**Fig. 2.** Distribution of butterfly families in botanical garden, Lahore.

the importance of urban green spaces in supporting butterfly biodiversity. A total 106 specimens were gathered from Kasur district, Punjab, Pakistan. Family Nymphalidae comprises the 56.6% and family Pieridae 43.6% (Saif, 2023).

The dominance of the Nymphalidae family in our study is consistent with findings from other tropical and subtropical regions. Nymphalidae, being the largest family of butterflies globally, is often the most abundant in species diversity in various habitats (Khyade *et al*., 2018). Sanaullah *et al*. (2024) collected the 120 species of butterflies from Battagram, KPK in which identify in to 17 genera and 21 species from four families: Nymphalidae, Pieridae, Lycaenidae and Papolionidae covering 48%, 24% and 4% respectively. For instance, in the Western Ghats of India, Nymphalidae constituted 55% of the observed butterfly species, indicating their adaptability to diverse environmental conditions (Kunte, 2001).

The studies from temperate regions reported a different composition of butterfly families, with Nymphalidae, Papilionidae and Pieridae often being predominant but in varying proportions due to climatic and ecological differences (Fiedler, 1998). The differences in family representation between tropical and temperate regions can be attributed to the distinct climate, vegetation and ecological interactions in these areas. This highlights the need for localized conservation strategies tailored to the specific environmental conditions and species present in each region.

The identification of rare species such as the common blue bottle (*Graphium sarpedon*), common crow (*Euploea core*), paper kite (*Idea leuconoe*), common windmill (*Byasa polyeuctes)* and chocolate pansy

(*Junonia iphita*) are noteworthy. These species are indicators of well-preserved habitats and ecological stability. Globally, the decline of butterfly populations due to habitat loss, climate change and pesticide use is well-documented. For example, studies in north America have shown significant declines in monarch butterfly populations, primarily due to habitat destruction and climate change (Pleasants and Oberhauser, 2013). In the European context, similar declines have been observed, with factors like agricultural intensification and habitat fragmentation being major drivers (Van Swaay *et al*., 2006).

The findings from the Lahore botanical garden align with global trends indicating the importance of conserving urban and peri-urban green spaces for sustaining butterfly diversity. These areas can serve as critical refuges for species, especially in regions facing rapid urbanization. The observed diversity in Lahore suggests that the botanical garden provides suitable microhabitats and a diversity of host plants, crucial for the survival of various butterfly species. This aligns with the global understanding that habitat diversity within urban environments can significantly support biodiversity (Aronson *et al*., 2014).

In conclusion, the study highlights the importance of systematic monitoring and conservation efforts in urban green spaces, which are increasingly recognized as vital for the preservation of butterfly species globally. Future research should focus on long-term monitoring and the effects of climate change and urban development on butterfly populations. Additionally, studies comparing butterfly diversity across different urban settings can provide insights into the most effective conservation practices.

## Conclusion

The study, conducted from September 2022 to May 2023, documented 24 butterfly species from three families in the butterfly house at the botanical garden, Lahore. The Nymphalidae family was the most represented, followed by pieridae and papilionidae. This research provides a foundational understanding of the butterfly diversity in this region, with implications for conservation and ecological monitoring.

## Acknowledgement

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**Conflict of Interest.** The authors declare that they have no conflict of interest.

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