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# Seasonal Dynamics Of Butterfly Species In Jiwaji University Campus Gwalior, Madhya Pradesh

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***Abstract***

The present study was carried out to document and analyze the common structure, diversity and abundance of butterfly in Jiwaji University, Campus, Gwalior Madhya Pradesh, India from July, 2023 to June, 2024. Direct visual encounter method used for recorded butterfly and photographs were taken for identification of butterfly species. A total of 40 species of butterflies belonging to 5 families were recorded. Nymphalidae family consists of maximum number (13) of butterfly species followed by Pieridae (11), Lycaenidae (9), Papilionidae (4) and Heperiidae (3) respectively. Total 496 number of butterfly captured among them *Eurema brigitta recorded* highest number of butterfly (14) of total abundance. Present study will help to assess the habitat and effective conservation of butterfly diversity in University campus.



**Keywords:** Bio-diversity, Habitat, Environment, Diversity, Abundance, Jiwaji University

## Introduction

Insects are one of the most intriguing creatures of the nature. And amongst the insects butterflies are conceivably the most remarkable and colourful. The butterflies are regarded as one of the most important elements of bio-diversity, they make up the second largest group under the order Lepidoptera (Alarape, 2015). Butterflies are diurnal and distinguished from moths by the presence of knobbed antennae, wings held vertical at rest with head and thorax well demarcated. As compared to other insects butterflies have wings covered with scales and hold an unique position on account of their bright and striking colouration and varied pattern on wing surfaces enhancing their beauty Bepari et al., (2023).
Butterflies are the most fascinating group of insects to humankind, often regarded as flagship species. They are the good bio-indicators of the ecosystem and are very sensitive to changes in the environment. They play an important role in food chain and are valuable pollinators in the local environment. Habitat enrichment has been found to play a vital role in conserving butterfly species and their abundance. Butterflies dependent on specific host plant in their developmental stages and hence their diversity indirectly reflects the floral diversity of a particular area (Kumar et al., 2019).
A notable fact is that the butterflies serve as good biological markers to assess the quality of the habitat that they live in and also the general environmental health (Anjali and Dhivya, 2021). Many species are strictly

seasonal and they live in particular habitats only (Padhye, 2012). Therefore minor changes in the habitats or the overall environment causes the species to migrate or even go extinct in that locality (Mennecher *et al,* 2003).

The butterflies constitute one of the most widely studied taxonomic groups among insects. Our country India is regarded as a butterfly haven amongst lepidopterist and entomologist. India has 1504 numbers of butterfly species (Tiple, 2011); out of this some are endemic as well as globally threatened species. When a butterfly community is studied various biotic as well as abiotic factors are taken into consideration, which directly influence their distribution patterns, i.e. humidity, temperature, wind, host plants, etc. This study sought to fill the knowledge gap on the diversity of butterflies and their abundance in the Jiwaji University, Campus, Gwalior. The aim of this study is to examine the diversity of butterflies and checklist of butterfly species and seasonal occurrence of the species. The knowledge obtained from the study is required to effectively and sustainably protect butterflies and their habitat. Although the current work is merely a first investigation, it offers a strong framework for future

**Study Area**

Jiwaji University (JU) situated in Gwalior, Madhya Pradesh state, established in the fond memory of the patron Jiwajirao Scindia of Gwalior in 23 May 1964 and Sarvepalli Radhakrishnan, the President of India, laid the foundation stone of the campus on 11 December 1964. The university has a sprawling campus of over 225 acres; it is situated at 26.202″N 78.197°E Longitude (Fig. 1). This area displays significant bio-diversity. Study area mostly dominated by Mango tree (*Mangifera indica*), Babul tree (*Accacia arabica*), Guava (*Psidium guajava*), Indian jujube (*Ziziphus mauritiana*), Indian banyan (*Ficus bengalensis*), Peepal tree (*Ficus religiosa*), Tamerind (*Tamarindus indico*), Neem (*Azadhirachta Indica*), Bel (*Aegle marmalos)*, Jamun (*Eugenia,ambolana*) etc, which are widely distributed and provide better host plants for both caterpillars and butterflies.

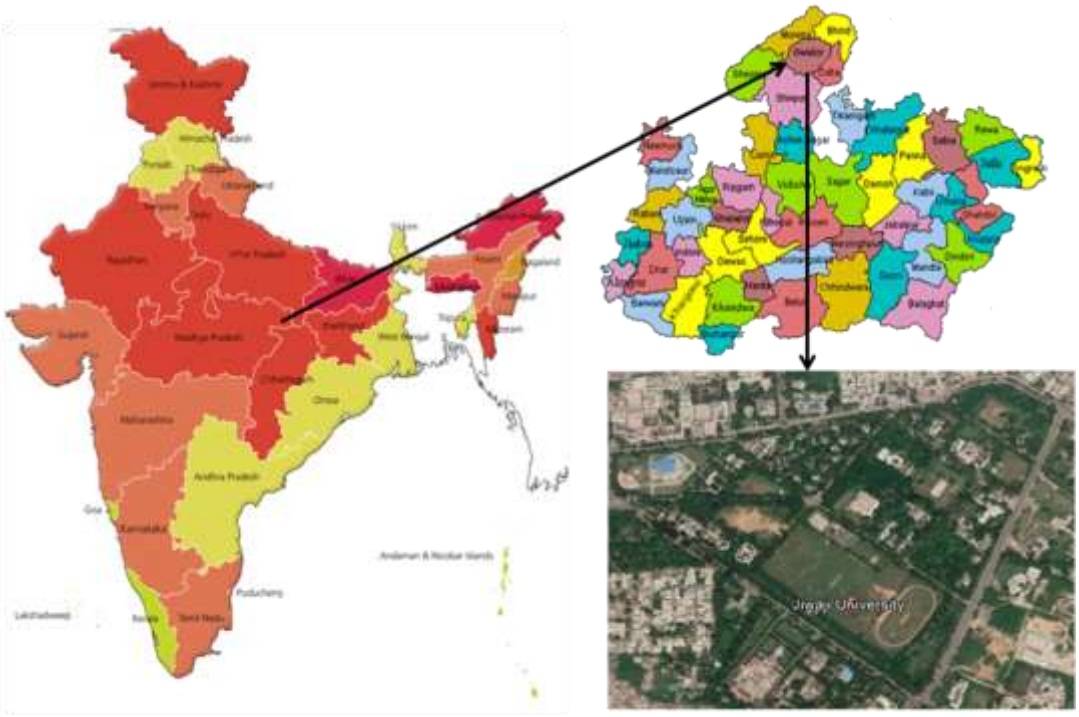

**Fig. 1:** Study site in Jiwaji University, Campus

**Methodology**

Random survey was carried out once a time in every month, by round walk method during morning hours 9:00 am to 11:00 am and in afternoon 3:00 to 5:00 pm form July 2023- June 2024. The survey area consists Azad Park, Mrignayni girls Hostel Garden, Rose Garden, Environment Garden, Sports Ground, Swami vivekanand Garden, Sarswati Garden, Lilypool, Picock Garden,. Visual encounter method and opportunistic sightings were employed to assess butterflies. Identification of the butterfly species on field was confirmed with the help of identification keys Kunte (2008), field guides namely 'The Book of Indian Butterflies by

Kehimkar (2008) and 'A guide to the Butterflies of Western Ghats, India by (Bhakare and Ogale, 2018) and with photographs captured time to time.

**Result and Discussion**

In university campus 496 butterflies recorded with 40 different species of butterfly belonging to 5 different families. Checklist of the recorded butterfly fauna with their common and scientific names, seasonal occurrence and local abundance status presented (Table 1). Panda *et al.,* (2016) recorded a total number of 53 species of butterflies belonging to 5 different families in Fakir Mohan University campus, Balasore, Odisha. Shouche and Ratnakar (2018) recorded 150 individuals of butterfly with 21 species belonging to the 5 different families in Vikram University campus, Ujjain. Dabhadkar and Prajapati (2020) recorded 40 species of butterflies belonging to 29 genera and 5 families during the study of butterfly diversity and abundance in M. N. College, visnagar, Gujrat, India. Nymphalidae was the most dominant family comprised 13 species with 32% followed by Pieridae 11 species with 27%, Lycaenidae 9 species with 23%, Papilionidae 4 species with 10% and Heperiidae 3 species with 8% (Fig. 2). Abdullahi *et al.,* (2019) recorded Nymphalidae was the richest family in the study area that comprised (9 and 43%) species of butterfly followed by Pieridae with (6 and 29%) species, Papilionidae and Lycaenidae families were the lowest with (3 and 14%) species.

Assessment of abundance status revealed that higher number of individual were recorded 14 species Small Grass Yellow of Pieridae family followed by 12 species Common Mormon of Papilionidae family, 11 species Blue Pansy of Nymphalidae family, 7 species Common Hedge Blue of Lycaenidae and 4 species Indian Skipper of Heperiidae family during the study work. Pandey and Tamboli (2022) state that Rich plant diversity attracting the butterflies by providing the nector and breeding ground. Modes of feeding and food are different in the adult and larval stage. A habitat that includes sufficient adult and larval food resources is a successful butterfly's habitat. Seasonal distribution of butterfly concerned, Great Eggfly, Small Salmon Arab, Pioneer, Forget-me-not and Indian Palm Bob species in Rainy season while Forget-me-not and Small Branded Swift species of butterfly were not recorded in winter season (Fig. 4). Out of total 496 recorded individual, highest number of individual 226 were recorded in summer season, 174 individual were in winter season and 96 individual were recorded in rainy season. Mallick (2023) recorded numbers of species were varying the year representing the season (monsoon)-wise distribution of butterfly species (Fig 4). Highest number of species were recorded during Post monsoon season (n=65) (September to November) followed by Monsoon season (n=43) (June to August), summer (n=24) (March to May) respectively while, the least number of species were recorded in the winter season (n=20) (December to February).

Local status revealed the present study that 16 species were common (40%), 11 species uncommon (27%), 10 species very common (25%) and 3 species rare (8%) of total recorded species from Jiwaji University, Campus (Fig. 3). Gupta and Kumar (2024) assess local abundance status revealed that 14 species were abundant, eight species were common, 14 species were occasional, and two species were rare in the study area during the study of Diversity and status of butterfly fauna at Kurukshetra University campus, Haryana, India.

**Table 1:** Taxonomic composition and number of individuals of butterflies recorded

| S. No | Common Name | Scientific Name | Seasonal Occurrence | | | Local Status |
|---|---|---|---|---|---|---|
| | | | R | W | S | |
| **Family: Nymphalidae** | | | | | | |
| **1.** | Lemon Pansy | *Junonia lemonias* | 3 | 7 | 5 | UC |
| **2.** | Blue Pansy | *Junonia orithiya* | 4 | 11 | 4 | C |
| **3.** | Yellow Pansy | *Junonia hierta* | 3 | 2 | 3 | UC |
| **4.** | Peacock Pansy | *Junonia almanac* | 2 | 3 | 4 | C |
| **5.** | Grey Pansy | *Junonia atlites* | 6 | 3 | 7 | C |
| **6.** | Common Castor | *Ariadne merione* | 2 | 1 | 3 | C |
| **7.** | Common Crow | *Euploea core* | 4 | 5 | 6 | VC |
| **8.** | Plain Tiger | *Danaus chrysippus* | 1 | 3 | 4 | VC |
| **9.** | Stripped Tiger | *Danaus genutia* | 2 | 4 | 5 | VC |
| **10.** | Great Eggfly | *Hypolimnas bolina* | - | 4 | 3 | R |
| **11.** | Blue Tiger | *Tirumala limniace* | 1 | 6 | 8 | UC |
| **12.** | Common Evening Brown | *Melanitis leda* | 3 | 3 | 6 | UC |

| | | | | | | |
|---|---|---|---|---|---|---|
| **13.** | Common Leopard | *Phalantha phalantha* | 2 | 5 | 8 | C |
| **Family: Pieridae** | | | | | | |
| **14.** | Common Grass Yellow | *Eurema hecabe* | 4 | 6 | 9 | VC |
| **15.** | Spotless Grass Yellow | *Eurema laeta* | 2 | 5 | 7 | R |
| **16.** | Small Grass Yellow | *Eurema brigitta* | 6 | 11 | 14 | VC |
| **17.** | Mottled Emigrant | *Catopsilia pyranthe* | 3 | 6 | 9 | VC |
| **18.** | Common Emigrant | *Catopsilia pomona* | 2 | 4 | 5 | VC |
| **19.** | White Orange Tip | *Ixias Marianne* | 1 | 5 | 4 | VC |
| **20.** | Yellow Orange Tip | *Ixias pyrene* | 2 | 6 | 7 | R |
| **21.** | Small Salmon Arab | *Colotis amata* | - | 1 | 3 | C |
| **22.** | Small Orange Tip | *Colotis etrida* | 2 | 7 | 9 | C |
| **23.** | Psyche | *Leptosia nina* | 2 | 3 | 7 | C |
| **24.** | Pioneer | *Belenoise aurota* | - | 2 | 2 | C |
| **Family: Papilionidae** | | | | | | |
| **25.** | Lime Butterfly | *Papilio domoleus* | 3 | 9 | 5 | VC |
| **26.** | Common Jay | *Graphium doson* | 5 | 7 | 4 | C |
| **27.** | Common Rose | *Pachliopta aristolochiae* | 2 | 6 | 3 | C |
| **28.** | Common Mormon | *Papilio polytes* | 2 | 8 | 12 | VC |
| **Family: Lycaenidae** | | | | | | |
| **29.** | Small Cupid | *Chilades parrhassius* | 3 | 4 | 5 | UC |
| **30.** | Lesser Grass Blue | *Zizina otis* | 5 | 3 | 7 | UC |
| **31.** | Common Pierrot | *Castalius rosimon* | 1 | 3 | 5 | C |
| **32.** | Forget-me-not | *Catochrysops strabo* | - | - | 1 | UC |
| **33.** | Pea Blue | *Lampides boeticus* | 3 | 4 | 9 | C |
| **34.** | Scarce Shot Silverline | *Spindasis elima* | 3 | 1 | 7 | UC |
| **35.** | Dark Grass Blue | *Zizeeria karsandra* | 4 | 3 | 5 | C |
| **36.** | Common Hedge Blue | *Acytolepis puspa* | 2 | 4 | 3 | VC |
| **37.** | Tiny Grass Blue | *Zizula hylax* | 1 | 2 | 4 | C |
| **Family: Heperiidae** | | | | | | |
| **38.** | Indian Skipper | *Spialia galba* | 1 | 4 | 5 | UC |
| **39.** | Indian Palm Bob | *Suastus gremius* | - | 3 | 7 | UC |
| **40.** | Small Branded Swift | *Pelopidas mathias* | 4 | - | 2 | UC |

R= Rainy, W= Winter, S= Summer, Status: VC = Very Common, C = Common, UC = Uncommon, R = Rare

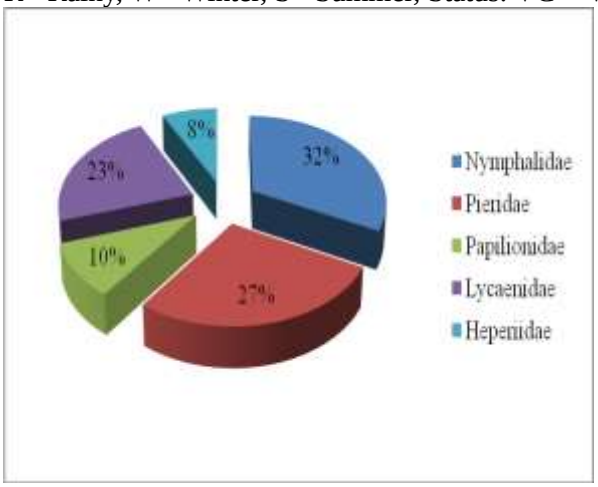


**Fig: 2:** Family wise recorded speceis

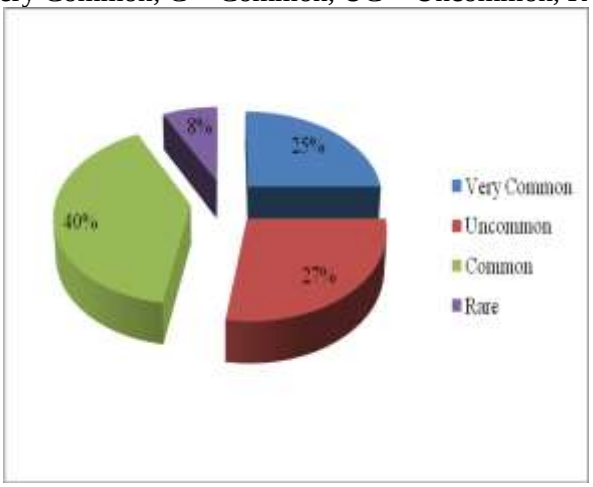


**Fig: 3:** Local status of recorded speceis

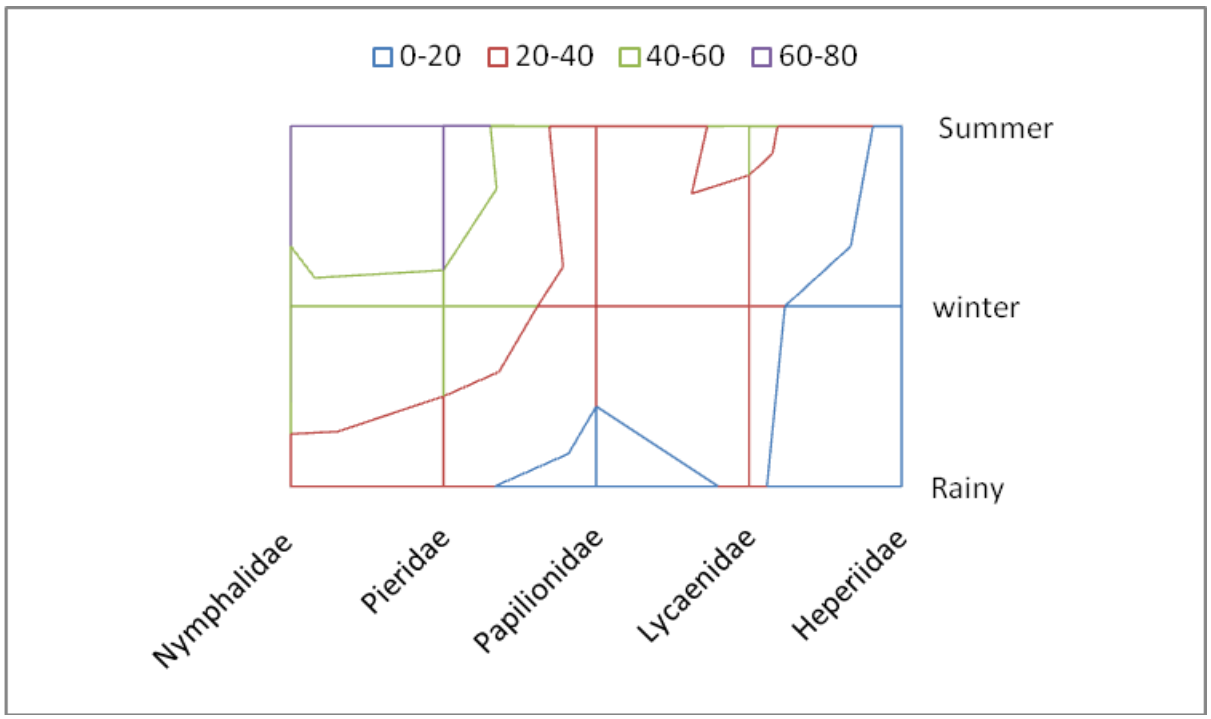


**Fig. 4:** Seasonal comparative abundance of recorded butterfly species among families

## Conclusion

The occurrence of 40 species of butterflies shows that the environmental health of campus is good. The ecological condition of campus is helpful in butterfly's conservation. The present study will prepare a preliminary data of butterfly diversity for future study. Although the campus area supports a good number of butterfly species but it is necessary to conserve butterflies natural habitat by creating students awareness program at college. On the basis of the survey, the work of conserving the butterflies is also essential for pest control. Presence of thriving butterfly communities are therefore an indicator of a healthy ecosystem.

## References

1. Kehimkar, I. (2008): The Book of Indian Butterflies. Bombay Natural History Society, Mumbai. 497.
2. Bhakare, M. and Ogale, H. (2018): A guide to the butterflies of Western Ghats (India). First edition. 496.
3. Panda, B., Behera, B. and Parida, P. (2016): Butterfly diversity in Fakir Mohan University camus, Balasore, Odisha, India. *Planet*, 14(2): 86-98.
4. Shouche, S. and Ratnakar, S. (2018): Butterfly species diversity from Vikram University, Campus Madhya Pradesh, India. *Asian Journal of Science and Technology*, 9(4): 7964-7969.
5. Dabhadkar, S. and Prajapati, R. (2020): A study of butterfly species diversity in M. N. College campus, Visnagar, Mehsana District, Gujarat, India. *International Journal of Research in Engineering, Science and Management*, 3(12): 98-104.
6. Kunte, K. (2008): Seasonal Pattern in butterfly abundance and species diversity in four tropical habitats in northern Western Ghats. *J. Biosciences*, 22(5): P593-603.
7. Abdullahi, M., Larkin, A., Kumar, A., Kumar, H. and Idris, A. L. (2019): A study on butterfly diversity in Prayagraj district of Uttar Pradesh, India. *International Journal of Advanced Research in Biological Sciences*, 6(8): 112-119.
8. Pandey, V. and Tamboli, R. K. (2022): A Glimpse of butterfly diversity in campus area of Kirodimal Government Arts and Science College Raigarh, India. *Journal of Environmental Science, Toxicology and Food Technology*, 16(3): 23-28.
9. Udaya K. K., Rathod, R., Pai, V., Karthik, N. J. and Nagaraj, S. (2019): Study of butterfly diversity in college of forestry campus, Sirsi, Uttara Kannada. *Journal of Entomology and Zoology Studies*, 7(4): 01-11.

10. Alarape, A. A., Omifolaji, J.K. and Mwansat, G. S. (2015): Butterfly Species Diversity and Abundance in University of Ibadan Botanical Garden, Nigeria. *Open Journal of Ecology,* 5: 352-360.
11. Anjali, P. S. and Dhivya, R. (2021): Butterfly species richness and diversity in selected areas of Thootha, Palakkad district, Kerala, India. *Journal of Emerging Technologies and Innovative Research,* 8(4):1036-1041.
12. Padhye, A., Shelke, S. and Dahanukar, N. (2012): Distribution and composition of butterfly species along the latitudinal and habitat gradients of the Western Ghats of India. *Journal of species lists and distribution,* 8(6): 1196-1215.
13. Gupta, V. and Kumar, P. (2024): Diversity and status of butterfly fauna at Kurukshetra University campus, Haryana, India. *Journal of Threatened Taxa,* 16(5): 25209–25219.
14. Mallick, A. I. (2023): Abundance, habitat preference and seasonal patterns of different butterfly species (Order: Leidoptera): A preliminary study in West Bengal State University (WBSU) campus, West Bengal, India. *International Journal of Advanced Research in Biological Sciences,* 10(3): 6-21.