

Diversity and Distribution of Butterflies from Chintamunishwar Hill near Bharsingi, Maharashtra, India

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ABSTRACT:

This study investigated the diversity, distribution, and composition of butterfly species on Chintamunishwar Hill near Bharsingi, Maharashtra, over a year-long period from February 2024 to January 2025. A comprehensive survey documented a total of 120 individual butterflies, representing 20 distinct species across five families. The findings revealed a notable dominance of the Nymphalidae family, accounting for nine species, including *Junonia lemonias*, *Danaus chrysippus*, and *Euploea core*. This suggests a rich ecological niche for these species within the study area. The Pieridae family contributed five species, such as *Eurema hecabe* and *Catopsilia pyranthe*, indicating a substantial presence of these butterflies. The Lycaenidae family was represented by three species, while the Papilionidae family comprised two. Notably, the Hesperidae family was represented by only one species, *Hasora chromus*. This research provides baseline data on the butterfly fauna of Chintamunishwar Hill, highlighting the area's biodiversity and contributing to a broader understanding of regional insect ecology. Further studies could explore seasonal variations and the impact of environmental factors on butterfly populations in this region.

Keywords: Butterflies, Bharsingi, Chintamunishwar Hill, Composition, Diversity.

INTRODUCTION:

More than half of the world's known animals are insects, and the Lepidoptera are regarded as one of the important components of biodiversity and are the second order among insects, made up of approximately 150,000 species so far known to the literature (New and Collins, 1991). Approximately 17,200 species of butterflies are found throughout the world, of

which 1,501 species of butterflies are known from India (Kunte, 2000). Butterflies are lovely and graceful insects that provide economic and ecological benefits to human society (Bubesh *et al.*, 2012). Butterflies play an immense role in pollination, bringing variations through kinds of pollen dispersion from one place to another place (Mahendra *et al.*, 2013). Although India has a rich butterfly fauna, due to various reasons such as habitat destruction, fire, use of pesticides and weedicides, and illegal collection for trade, many species have become rare, and some are on the verge of extinction. Butterflies are potentially useful ecological indicators of urbanization because they are sensitive to changes in microclimate and temperature (Winter-Blyth, 1957). Increase urbanization, one of the main causes of the decrease in butterfly species richness, diversity, and abundance (Blair and Launer, 1997; Clark *et al.*, 2007 and Thomas *et al.*, 1998).

The diversity and distribution of a particular species of butterfly is dependent not only on the geography of the area and the ability of the species to move around within it, but also on the ecological demands of the species. Many species of butterflies are nectar feeders and thus, frequently visit flowers and move from one flower to another (Tiple *et al.*, 2006) and larvae are feeds on their host plants (Tiple *et al.*, 2011; Nitin *et al.*, 2018). Butterflies are one of the best-known pollinators and bio indicators (Balmer and Erhardt, 2000; Sharma and Joshi, 2009; Durairaj and Sinha, 2015) undoubtedly perform beneficial role in assisting with plant pollination in the ecosystem. Thus, butterflies are both beneficial and on the other hand damage caused by the larvae as they feed on valuable forestry and agricultural crops is considerable (Beeson, 1941; Browne, 1968; Joshi *et al.*, 2004 and Nair, 2007).

Thus, this study on butterfly diversity serves as a vital indicator of an area's ecological health, as these insects are highly sensitive to environmental fluctuations. Their presence, absence, or population shifts provide a snapshot of the ecosystem's overall condition, allowing researchers to gauge its stability. By documenting butterfly species, including identifying vulnerable or endangered ones, this research lays the groundwork for developing effective conservation strategies. This data were crucial for preserving both the insects themselves and their habitats, ultimately safeguarding the area's natural beauty and biodiversity. In essence, such a study translates into actionable insights for ecological preservation.

MATERIALS AND METHODS:

Chintamunishwar Hill is a part of the village Paradsinga in the Barsingi of Nagpur district. The area covered under this region is over 2 sq. km. The rich plantation in this region enriches the biodiversity. The present study was carried out for a period of one year from February 2024 to January 2025. We used a digital camera (Nikon 7000) to make the observations. The sites were visited in morning hours to note maximum possible of butterflies and record its activities. Identification of adult individuals was carried out using identification keys provided by (Evans, 1932; Wynter-Blyth, 1957; Kunte, 2000; Kehimkar, 2008), field guides (Singh, 2017; Sondhi and Kunte, 2018) and published literatures (Smetacek, 2016 and 2018). No capture or collection was made during the present study. The present work provided the update comprehensive checklist of butterflies in the study area with their abundance and diversity.

RESULTS AND DISCUSSION:

Butterfly diversity and distribution are influenced by a complex interplay of environmental factors, including habitat availability, climate, and the presence of suitable host plants. Globally, butterfly species exhibit a wide range of distribution patterns, with tropical regions generally displaying the highest diversity. Factors such as altitude, rainfall, and vegetation structure significantly impact butterfly populations. Conversely, habitat fragmentation and destruction, often due to human activities, pose significant threats to butterfly populations worldwide, leading to localized extinctions and reduced diversity. Therefore, monitoring butterfly diversity and distribution serves as a crucial indicator of ecosystem health, highlighting the importance of conservation efforts.

The present study conducted on Chintamunishwar Hill near Bharsingi documented a diverse butterfly population, revealing the presence of 120 individuals representing 20 distinct species across five families from the Chintamunishwar Hill near Bharsingi. These species were *Junonia lemonias* (Lemon pansy) with 3 individuals, *Junonia orithya* (blue pansy) with 4 individuals, *Junonia almana* (peacock pansy) with 2 individuals, *Danaus chrysippus* (plain tiger) with 3 individuals, *Danaus genutia* (striped tiger) with 4 individuals, *Euploea core* (common crow) with 6 individuals, *Tirumala limniace* (blue tiger) with 4 individuals, *Melanitis leda* (common evening brown) with 2 individuals, *Ariadne marione* (common castor) with 2 individuals, *Phalantha phalantha* (common leopard) with 2 individuals, *Belenois aurota* (India pioneer) with 2 individuals, *Eurema hecabe* (common grass yellow) with 60 individuals, *Catopsilia pyranthe* (mottled emigrant) with 16 individuals, *Ixias marriane* (white orange tip) with 1 individuals, *Cepora nerissa* (common gull) with 1 individuals, *Papilio demoleus* (lime butterfly) with 1 individuals, *Graphium agamemnon* (tailed jay) with 1 individuals, *Chilades parrhassius* (small cupid) with 1 individuals, *Tarucus nara* (striped pierrot) with 3 individuals, *Zizina otis* (lesser grass blue) with 2 individuals, *Arhopala bazalus* (Powdered oakblue) with 1 individuals and *Hasora chromus* (common banded awl) with 2 individuals. The maximum number of species belonged to the family Nymphalidae (10), followed by Pieridae (5), Lycaenidae (4), Papilionidae (2), and the minimum number of species was noted in the family Hesperidae (1). This assessment provides valuable insights into the local butterfly diversity and underscores the ecological significance of Chintamunishwar Hill (Table-1 and 2).

Similar results were also recorded by Singh and Chib (2014) documented 125 butterfly species across five families, with Nymphalidae being the most abundant. This aligns with Charns (2015) findings of 54 species in Punjab, also dominated by Nymphalidae. Similarly, Bubesh *et al.*, (2012) observed 50 species from five families, noting the prominence of Nymphalidae and Lycaenidae. Further supporting this trend, Sayeswara (2018) reported Nymphalidae as the most significant family, representing 44.4% of recorded species, followed by Papilionidae (22.2%) and others. Studies on butterfly family distribution show varying dominant groups. Saurav *et al.*, (2017) found Lycaenidae to be most prevalent (34.9%), while Koneri and Nangoy (2019) and Sethy *et al.*, (2014)

reported Nymphalidae as the dominant family, with significantly higher percentages (53.81% and 42.5%, respectively). These studies also differed in the relative abundance of other families like Papilionidae, Pieridae, and Hesperidae.

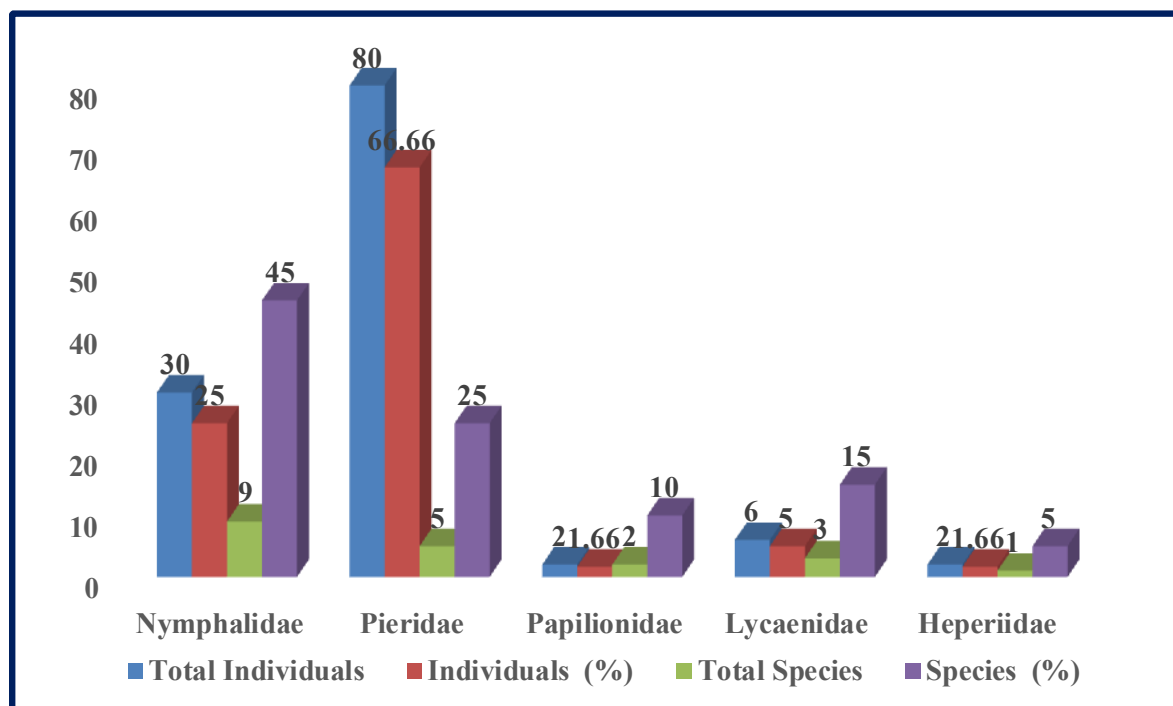
Table1: Taxonomic composition and number of individuals of butterflies recorded from Chintamunishwar Hill near Bharsingi

Sr. No.	Family	Scientific Name	Common Name	No. of Individuals
1	Nymphalidae	<i>Junonia lemonias</i>	Lemon pansy	3
2		<i>Junonia orithya</i>	Blue pansy	4
3		<i>Junonia almana</i>	Peacock pansy	2
4		<i>Danaus chrysippus</i>	Plain Tiger	3
5		<i>Danaus genutia</i>	Common Tiger	4
6		<i>Euploea core</i>	Common Crow	6
7		<i>Tirumala limniace</i>	Blue Tiger	4
8		<i>Melanitis leda</i>	Common evening brown	2
9		<i>Ariadne merione</i>	Common castor	2
10	Pieridae	<i>Belenois aurota</i>	Pioneer white or caper white	2
11		<i>Eurema hecabe</i>	Common Grass Yellow	60
12		<i>Catopsilia pyranthe</i>	Mottled Emigrant	16
13		<i>Ixias marriane</i>	White orange tip	1
14		<i>Cepora nerissa</i>	Common Gull	1
15	Papilionidae	<i>Papilio demoleus</i>	Lime Butterfly	1
16		<i>Graphium agamemnon</i>	Common bluebottle	1
17	Lycaenidae	<i>Chilades parrhassius</i>	Small Cupid	1
18		<i>Tarucus nara</i>	Striped Pierrot	3
19		<i>Zizina otis</i>	Lesser Grass Blue	2
20	Heperiidae	<i>Hasora chromus</i>	Common Banded Awl	2

Table 2: Total Number and percentage of individuals and species of different family

Sr. No	Family	Total Individuals	Individuals (%)	Total Species	Species (%)
1	Nymphalidae	30	25	9	45
2	Pieridae	80	66.66	5	25
3	Papilionidae	2	1.66	2	10
4	Lycaenidae	6	5	3	15
5	Heperiidae	2	1.66	1	5

Fig 1: Number of the species of butterflies in a family and species wise composition in the study area



CONCLUSION:

The findings of present study reveal a high level of butterfly diversity within the study area, with the Nymphalidae family representing the most abundant group. This dominance indicates favorable environmental conditions for these species. Consequently, we conclude that the area possesses significant ecological value, warranting further investigation. Comprehensive documentation of the butterfly diversity is crucial for developing effective conservation strategies and ensuring the long-term protection of these vital pollinators.

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