



Study of some butterflies of in and around Kelwa Beach, Palghar, Maharashtra, India

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Abstract

Butterflies are ecologically important insects that serve as pollinators, prey species, and bioindicators of environmental health. The present study was carried out in and around Kelwa Beach, Palghar District, Maharashtra, India, between June 2023 and November 2024, with the objective of documenting butterfly occurrence and diversity across pre-monsoon, monsoon, and post-monsoon seasons. Field observations were made using DSLR and mobile cameras, and no specimens were captured or harmed during the survey. A preliminary checklist of butterflies was prepared, representing multiple families including Papilionidae, Pieridae, Nymphalidae, Lycaenidae, and Hesperidae. Seasonal variation in species richness was observed, with monsoon and post-monsoon months showing relatively higher diversity, likely due to the availability of larval host plants and nectar resources. The study highlights the ecological significance of the Kelwa coastal ecosystem in supporting butterfly populations despite increasing anthropogenic pressures. This baseline information can serve as a foundation for future biodiversity assessments and conservation strategies aimed at protecting butterfly diversity in Palghar region.

Keywords: Butterflies, diversity, kelwa beach, palghar, maharashtra, bioindicators, conservation

Introduction

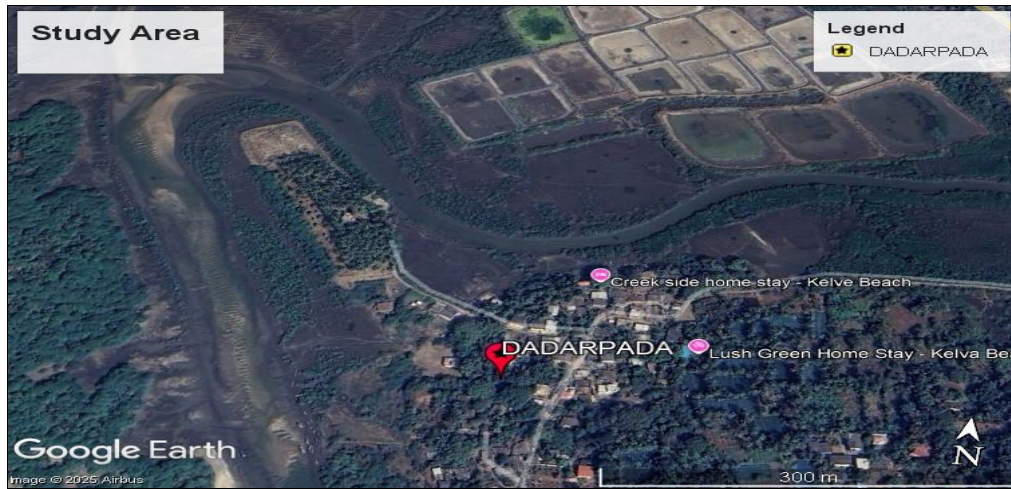
On Earth, insects are the most diverse group of organisms. Since the class Insecta contains about 80% of all animal species, it is the largest class in the animal kingdom. Because they come in so many different forms, insects are important to the global environment (Bhura R, et al., 2024) [2]. One of nature's most beautiful species, butterflies are members of the animal kingdom's largest group, the arthropods. The Greek words "lepidos," which means "scale," and "ptera," which means "wings," are the origin of the term "Lepidoptera." Members of this group are therefore referred to as "scaly winged insects." (Nimbalkar et al., 2011). Butterflies belong to the lepidopteran order, (Tingare, 2025) [8]. The pigments that have been deposited in their scales give butterflies their stunning colours. They serve as food sources, pollinators, and markers of the health of the environment, all of which are vital to it. Due to their pollination and food supply, butterflies aid in the restoration of ecosystems. Growing numbers of butterflies could be a sign of more diverse plants and other pollinator species in restored regions. In addition to being helpful indicators of ecological, seasonal, and climatic changes, butterflies support the creation of conservation programs (Bharat B et.al, 2023) [1]. There are 18,000 kinds of butterflies known to exist worldwide, with 1800 of those species occurring in India. This number fluctuates because new butterflies are constantly being added, and taxonomists continue to debate

about the status of many species (Tiple A, 2018) [9]. The impacts of urbanisation are known to affect butterflies in a sensitive way (Dass K et.al, 2020) [3]. Certain host plants provide pollen, nectar, and leaves for butterflies and their caterpillars. The diversity of plants in the area, especially the shrubs and herbs, is reflected in the variety of butterflies (Karkar, 2020) [5]. Some butterfly species are important to the food chain because they are predators of dangerous insects, and it is well known that butterflies react sensitively to the effects of urbanisation. Butterflies are an essential component of the ecosystem and are vital for pollination since they visit different flowers to consume nectar (Talmale S, 2023) [7]. This study's primary goal has been to conduct preliminary butterfly observations and conduct checklists for butterfly occurrence and richness in Kelwa Beach, Palghar.

Materials and Methods

Study Area

The Palghar taluka in the Palghar district of Maharashtra, India, is the location of the current study. An investigation was conducted in the months leading up to, during, and following the monsoon season. Between June 20, 2023, and November 30, 2024, the current study was conducted. The butterflies were clicked with help of DSLR camera and mobile camera and no butterfly was killed or captured in the process.



Map of Dadarpada area of Kelve Village, Maharashtra.

Table 1: The list of Butterflies

Sr. No	Family	Scientific Name	Common Name
1	Papilionidae	Graphium Sarpedon	Common Bluebottle
2		Graphium Agamemnon	Tailed Jay
3		Graphium Agamemnon	Spot Swordtail
4		Graphium nomius	Common Mormon
5		Papilio polytes	Blue Mormon
6		Papilio demoleus	Lime Butterfly
7		Atrophaneura aristolochiae	Common Rose
8	Nymphalidae	Tirumala limniace	Blue Tiger
9		Danaus genutia	Striped Tiger
10		Parantica aglea	Glassy Tiger
11		Danaus genutia	Plain Tiger
12		Euploea core	Common Crow
13		Ypthima huebneri	Common Four ring
14		Acraea vialae	Towny Coster
15		Neptis hylas	Common Sailer
16		Euthalia aconthea	Common Baron
17		Ariadne merione	Common Caster
18		Junonia iphita	Chocolate Pansy
19		Junonia atlites	Grey Pansy
20		Hypolimnas bolina	Great Egg fly
21	Kallima harsfieldi	Blue Oakleaf	
22	Pieridae	Eurema hecabe	Common Grass Yellow
23		Catopsilia Pomona	Common Emigrant
24		Pareronia valeria	Common Wonderer
25		Cepora Nerissa	Common Gull
26		Delias eucharis	Common Jezebel
27		Colotis amata	Small Salmon Arab
28	Lycaenidae	Castalius rosiman	Common Pierrot
29		Talicauda nyseus	Red Pierrot
30		Zizula hylax	Tiny Grass Blue
31		Chiladea pandava	Plain Cupid
32	Hesperiidae	Hasora chromus	Common Banded Awl
33		Suastrus gremius	Indian Palm Bob
34		Pelopidas mathias	Small Branded Swift
35		Udaspes folus	Grass Demon

Table 2

Sr. No	Identified Genera and Species		
	Family	Genera	Species
1	Papilionidae	03	07
2	Nymphalidae	11	14
3	Pieridae	06	06
4	Lycaenidae	04	04
5	Hesperiidae	04	04
Total	05	28	35

Table 3

Sr. No	Species	IUCN Status
1	Blue Mormon (<i>Papilio polymnestor</i>)	Not Evaluated (NE)
2	Common Jezebel (<i>Delias eucharis</i>)	Not Evaluated (NE)
3	Crimson Rose (<i>Pachliopta hector</i>)	Least Concern (LC)
4	Common Mormon ((<i>Papilio polytes</i>)	Not Evaluated (NE)
5	Common Crow (<i>Euploea core</i>)	Not Evaluated (NE)
6	Common Tiger (<i>Danaus genutia</i>)	Not Evaluated (NE)
7	Plain Tiger (<i>Danaus chrysippus</i>)	Not Evaluated (NE)





Red Pierrot



Common Jezebel



Common Caster



Plain Cupid



Lime Butterfly



Common Grass Yellow



Common Crow



Blue Oakleaf



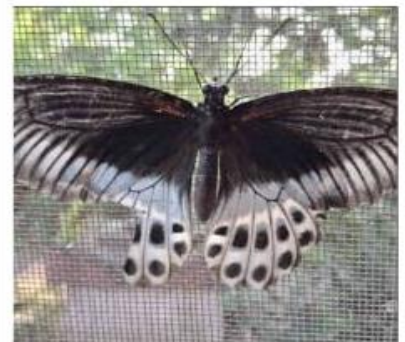
Common Rose



Common Sailer



Common Baron



Blue Mormon



Discussion

The present study recorded 35 species of butterflies belonging to 5 families from the Kelwa Beach area of Palghar, Maharashtra. Among these, the family Nymphalidae was the most dominant, contributing 14 species (40%) to the total checklist, followed by Papilionidae (7 species), Pieridae (6 species), Lycaenidae (4 species), and Hesperidae (4 species). Similar dominance of Nymphalidae has been reported from other regions of Maharashtra (Tiple et al., 2006; Kunte, 2000), suggesting that this family is highly adaptive to varied habitats, particularly in semi-urban and coastal landscapes.

The diversity recorded here is noteworthy, considering the coastal and semi-urban setting of Kelwa Beach. Coastal habitats often provide abundant nectar plants and larval host plants, supporting butterfly richness. The presence of species such as *Papilio demoleus* (Lime Butterfly) and *Danaus chrysippus* (Plain Tiger), which are highly adaptive and widely distributed, indicates the availability of host plants like Rutaceae and Asclepiadaceae families in the study area. Meanwhile, species such as *Kallima inachus* (Blue Oakleaf), which are more habitat-sensitive, highlight the presence of relatively undisturbed patches of vegetation. The IUCN conservation status assessment shows that most species fall under Not Evaluated (NE), with only *Pachliopta hector* (Crimson Rose) listed as Least Concern (LC) (IUCN, 2023) [4]. Although none of the species observed in the present study are threatened, the lack of evaluation for many highlights the need for more comprehensive assessments of butterfly species at the global and regional levels.

Urbanization and tourism are increasing around Kelwa Beach, and butterflies, being highly sensitive to habitat

disturbance, may be directly impacted. Their dependence on host plants for larval and adult stages makes them excellent ecological indicators (Kocher & Williams, 2000). Hence, continuous monitoring of butterfly populations in this coastal region can provide insights into ecosystem health and biodiversity changes.

Comparing the species richness (35 species) with similar studies in other parts of Maharashtra, the numbers are moderately high. For example, Nimbalkar et al. (2011) reported 50 species in Bhor Tahsil, while Tiple (2011) documented 117 species in central Maharashtra. The slightly lower diversity at Kelwa may be attributed to urban pressures, limited forest cover, and seasonal fluctuations in floral resources.

Overall, the study underlines the ecological importance of Kelwa Beach as a habitat supporting diverse butterfly species and highlights the necessity of conservation strategies focusing on maintaining nectar and host plant diversity, controlling habitat degradation, and creating awareness among local communities.

Conclusion

The present study documented 35 butterfly species across 5 families from Kelwa Beach, Palghar, with Nymphalidae as the most dominant family. This indicates that despite increasing anthropogenic pressures, the coastal ecosystem of Kelwa still supports a rich butterfly fauna.

Butterflies not only act as pollinators and food web components but also serve as bioindicators of environmental changes. The presence of both common and habitat-sensitive species emphasizes the ecological value of the area. To ensure long-term conservation of butterfly diversity

at Kelwa Beach, it is recommended that: Habitat restoration and protection of host and nectar plants be prioritized. Awareness programs involving local communities and tourists be initiated to reduce disturbances. Long-term monitoring of butterfly populations be conducted to detect ecological shifts caused by urbanization and climate change. Thus, this preliminary checklist serves as a baseline for future ecological and biodiversity studies in the region and can contribute towards framing conservation strategies for butterflies in coastal Maharashtra.

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