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Checklist of butterfly fauna in Tungarli lake, Lonavala, Maharashtra

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Abstract

Butterflies are known to be indicators of good ecological health in any ecosystem. Considering this, it becomes essential to study its diversity and its conservation status while they face environmental degradation and urbanization in the current era. The present study was conducted between January 2022 to December 2024 for a period of two years in Tungarli lake which is a well-known tourist spot in Lonavala, Maharashtra, India. A total of 18 Lepidoptera species were observed that belonged to 5 families. Family-wise distribution and season-wise abundance studies were conducted. These findings are significant for monitoring the diversity and applying conservation strategies in the lake for future.

Keywords: Lepidoptera, butterfly, relative abundance, biodiversity, conservation, seasonal variation

Introduction

Butterflies are ecologically sensitive insects belonging to order Lepidoptera from class Insects in phylum Arthropoda. Having a special position in ecosystem, the presence of butterflies and their diversity indicates good environmental health of the ecosystem. ^[1] ^[2] ^[3]. They are important contributors in the food chain and act as bio-indicators of environmental variation and quality ^[4]. At present publications in Red Data Book shows that many species are vulnerable, with specific threats including habitat loss from urbanization and environmental changes. In addition to this, very scarce studies on butterfly diversity have been done in Lonavala region. Hence, it is a necessity to evaluate the diversity and treasure the faunal data along with floral data in these areas, especially the places which are prone to tourist activities.

Materials and Methods**a. Study area**

Tungarli lake is present in the Rajmachi villagae of Lonavala, Maharashtra, India. It is a man-made lake and is one of the major water supply sources for Lonavala city. It is known for its scenic location and is surrounded by the Sahyadri mountain ranges. This makes it an ideal spot for tourism and activities like trekking, photography and picnic by the visiting tourists. It is located within the GPS coordinates of 18°46' N and 73°24' E.



Fig 1: Study area- Tungarli lake, Lonavala

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b. Methods

The study was carried out from January 2022 to December 2024 for a period of two years. The butterflies were observed by using Pollard walk method in which the route of survey was followed by slow and steady walk and butterflies were recorded within 2.5 meters on the sides and 5 meters in the front [5]. The study was carried out usually in between 8 am to 2 pm. Lepidoptera were observed, photographed and identified using the field guide. When identification was difficult, capture and release method was used. In capture and release method, an aerial net was used and after identification the butterflies were released back. The butterflies recorded during the survey are classified as Very Common (VC), Common (C), Not Rare (NR), Rare (R), and Very Rare (VR) [6, 7]. For reference and proper identification, the field guide Butterflies of India [8], Naturalist's Guide to Butterflies of India [9] and Evans (1932) [10] were used.

Results and Discussion

A total of 18 Lepidoptera species were observed in Tungarli lake that belonged to 5 families. 5 species from family Nymphalidae, 6 species from family Pieridae, 3 species each from family Lycaenidae and family Hesperidae while only 1 species was recorded from family Papilionidae. This has been summarized in Table 1.

Among the 18 species, five species were recorded as VC- very common (75-100 sightings), three species as C- common (50-75 sightings), five species as NR- not rare (25-50 sightings), three species as R- rare (5-25 sightings) and two species as VR- very rare (1-5 sightings).

Family wise distribution of species indicated that members of family Nymphalidae were most abundant and family Papilionidae was the least abundant. Percentage abundance suggests that only 1% species was from family Papilionidae in comparison to family Lycaenidae and Hesperidae which contributed to 7% and 6% abundance respectively which is almost similar. Family Pieridae contributed to 26 % of the

total species abundance while the maximum 60% abundance was contributed by Family Nymphalidae. This has been summarised in Figure 1 that shows pie diagram for family-wise abundance of species.

The seasonal distribution of butterflies was recorded and is summarised in Figure 2. It was found that maximum numbers of individuals were observed in the monsoon season in which 405 were recorded. This was followed by winter season in which 370 individuals were recorded and the least number of individuals were recorded in summer with 237 individuals. Species like *Danaus chrysippus* (Linnaeus, 1758), *Junonia lemonias* (Linnaeus, 1758), *Parantica aglea* (Stoll, 1782), *Tirumala limniace* (Gmelin, 1790), *Catopsilia pomona* (Fabricius, 1775), *Cepora nerissa* (Fabricius, 1775), *Eurema hecabe* (Linnaeus, 1758), *Pelopidas mathias* (Fabricius, 1798) and *Taractrocera ceramas* (Hewitson, 1868) were recorded the most during monsoon season and the least during summer season. On the contrary, species like *Euploea core* (Cramer, 1780), *Hebomoia glaucippe* (Linnaeus, 1758), *Eurema laeta* (Boisduval, 1836), *Ixias pyrene* (Linnaeus, 1764), *Castalius rosimon* (Fabricius, 1775), *Curetis thetis* (Drury, 1773) and *Ampittia dioscorides* (Fabricius, 1793) were most abundantly observed in winter season, moderately in monsoon and the least in summer. The Very Rare species namely, *Papilio demoleus* (Linnaeus, 1758) and *Caleta decidia* (Hewitson, 1876) were only recorded in monsoon and was almost negligible in summer and winter.

Conclusion

The present study regarding butterfly diversity in Tungarli lake of Lonavala provides a baseline data for future research. The lake being a tourist place has been facing tremendous attention in the recent years due to its scenic views. Hence, anthropogenic activities have widely increased which creates a need to monitor the existing biodiversity. Monitoring programmes should be engaged in a way that no stress is faced by the existing biodiversity and the ecological balance remains maintained.

Table 1: Lepidoptera diversity of Tungarli lake, Lonavala

Sr. No.	Species	Common name	Relative Abundance
Family Nymphalidae			
1	<i>Danaus chrysippus</i> (Linnaeus, 1758)	Plain Tiger	VC
2	<i>Euploea core</i> (Cramer, 1780)	Common Crow	VC
3	<i>Junonia lemonias</i> (Linnaeus, 1758)	Lemon Pansy	C
4	<i>Parantica aglea</i> (Stoll, 1782)	Glassy Tiger	VC
5	<i>Tirumala limniace</i> (Gmelin, 1790)	Blue Tiger	VC
Family Pieridae			
6	<i>Catopsilia pomona</i> (Fabricius, 1775)	Lemon Emigrant	VC
7	<i>Cepora nerissa</i> (Fabricius, 1775)	Common Gull	C
8	<i>Hebomoia glaucippe</i> (Linnaeus, 1758)	Great Orange Tip	NR
9	<i>Eurema hecabe</i> (Linnaeus, 1758)	Common Grass Yellow	NR
10	<i>Eurema laeta</i> (Boisduval, 1836)	Spotless Grass Yellow	R
11	<i>Ixias pyrene</i> (Linnaeus, 1764)	Yellow Orange Tip	R
Family Papilionidae			
12	<i>Papilio demoleus</i> Linnaeus, 1758	Lime Butterfly	VR
Family Lycaenidae			
13	<i>Caleta decidia</i> (Hewitson, 1876)	Angled Pierrot	VR
14	<i>Castalius rosimon</i> (Fabricius, 1775)	Common Pierrot	NR
15	<i>Curetis thetis</i> (Drury, 1773)	Indian Sunbeam	NR
Family Hesperidae			
16	<i>Ampittia dioscorides</i> (Fabricius, 1793)	Common Bush Hopper	C
17	<i>Pelopidas mathias</i> (Fabricius, 1798)	Small branded swift	R
18	<i>Taractrocera ceramas</i> (Hewitson, 1868)	Tawny-spotted Grass Dart	NR

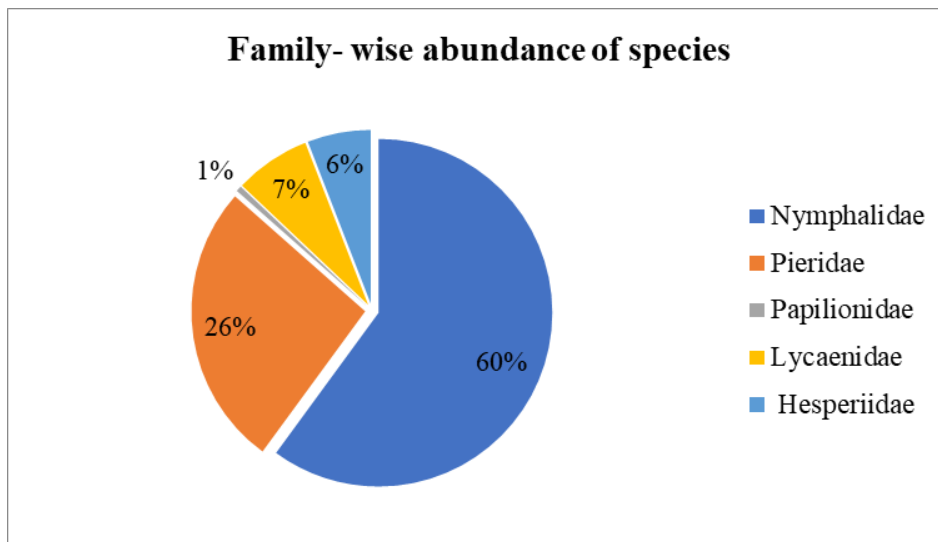


Fig 1: Family-wise abundance of species

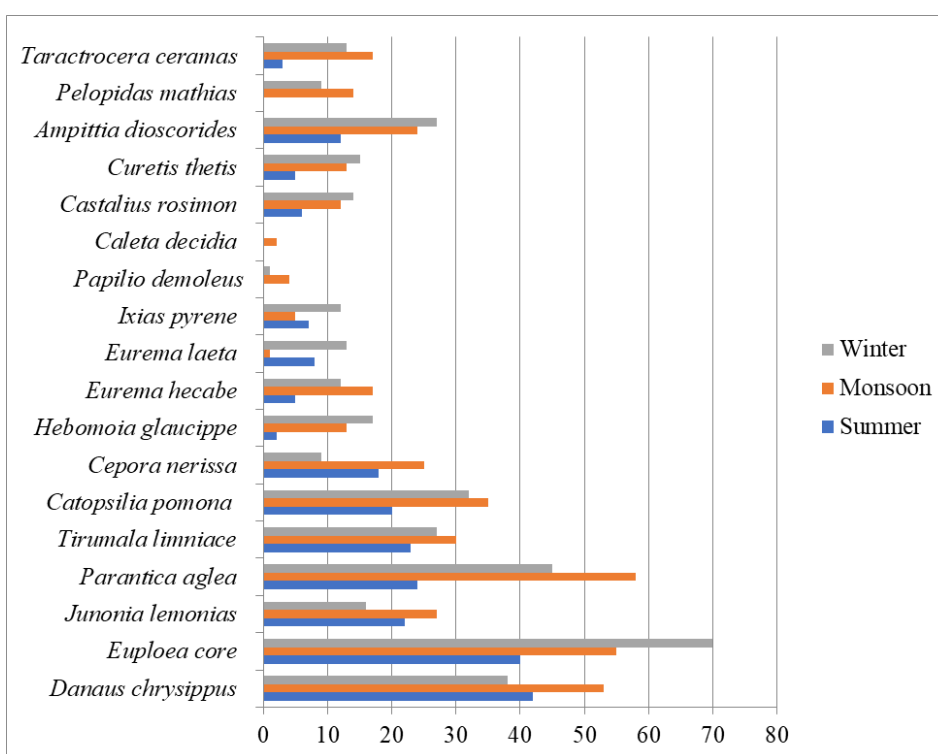


Fig 2: Season-wise abundance of species in Tungarli lake

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The authors declare that they have no conflicts of interest.

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