

DIVERSITY OF BUTTERFLY FAUNA IN AND AROUND TEHSIL PEHOWA, DISTRICT KURUKSHETRA, HARYANA (INDIA)

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ABSTRACT

Despite enormous diversity, abundance and role of butterflies in biodiversity and ecosystem, little is documented about butterfly fauna in the region of Haryana. Although protected areas were explored to a certain level but systematic study are lacking outside the protected areas of Haryana. Therefore, study aimed to generate a baseline data of the diversity and distribution of butterflies' fauna in tehsil Pehowa of district Kurukshetra, Haryana, India. District Kurukshetra occupies an area of 1530.00 km² having four Sub-Divisions viz. Thanesar, Pehowa, Shahbad and Ladwa. From March 2023 to November 2023 fortnightly periodic field visits were conducted for the butterfly survey in the selected study area following Pollard walk method and Random Sampling Method. A total of 25 butterfly species belonging to five families Papilionidae, Pieridae, Nymphalidae, Hesperidae and Lycaenidae were documented during study period. The results showed that family Lycaenidae was the most dominant one with highest RDi 32, having 8 species (7 genera) followed by Pieridae possess 7 species (6 genera); Nymphalidae with 5 species (4 genera); Hesperidae with 3 species (3 genera) and least dominated by family Papilionidae with 2 species (2 genera). The findings can be used as an important key source to evolve better management and conservation strategies for various butterfly species as their abundance indicates the well being of an ecosystem.

KEYWORDS

Butterfly, Diversity, Nymphalidae, Papilionidae, Pieridae

INTRODUCTION

The most varied group of species on Earth are insects. Class Insecta accounts for almost 80% of all the species in animal kingdom (Kapoor, 1985; Varshney, 1998) hence, it is the largest class of the Animal kingdom. Insects play significant roles in the ecology of the world due to vast diversity in their forms. They are one of the important links of the food web, play crucial role in pollination and some are useful as agricultural pest predators.

The term Lepidoptera has derived from Greek word, “lepidos” means ‘scale’ and “ptera” means wings. Hence, the members of this order are known as “scaly winged insects” (Nimbalkar *et al.*, 2011). With almost 160,000 described species of Lepidoptera, the total number of extant species is estimated to be around half a million (Kristensen *et al.*, 2007).

Among Lepidopterans, Butterflies are taxonomically well studied group, which have received reasonable amount of attention throughout the world. They are very delicate, beautiful and attractive creatures due to their colourful scaly wings so considered as the symbol of beauty and grace. They are diurnal in habit and easily identified by their beautiful colour, shape, and stylish flight. Butterflies have always attracted the attention of naturalists, environmentalists and conservationists due to their great aesthetic value and ecological importance. The Northern regions including the states of Haryana and Punjab also have a rich diversity of Butterfly fauna, but not explored to a greater extent. Little information on butterflies from the state of Haryana was documented by several workers. Keeping in view, study was planned to generate a baseline data of the diversity and distribution of butterfly fauna in Tehsil Pehowa of District Kurukshetra, Haryana.

MATERIAL AND METHODS

Study Area

District Kurukshetra occupies an area of 1530.00 km² having four Sub-Divisions viz. Thanesar, Pehowa, Shahbad and Ladwa. Tehsil Pehowa is located at 29.98°N and 76.58°E. It is situated at a distance of 27 km west from Kurukshetra and 26 km North-west from Pundri. The total area of Pehowa sub-division is 604.69 km² in which 525.5 km² is cultivable, 79.19 km² is Non-cultivable and 15.9 km² is forest area. The survey was conducted in Tehsil Pehowa and its nearby villages such as Thana, Bherian, Bhor Saidan, Lohar Majra, Thaska Miranji, Lotni, Shahpur and Seonsar (Fig. 1). The study covers a diverse range of landscapes such as agricultural land, gardens, canal-side vegetation, roadside plantations, grasslands and weed bushes.

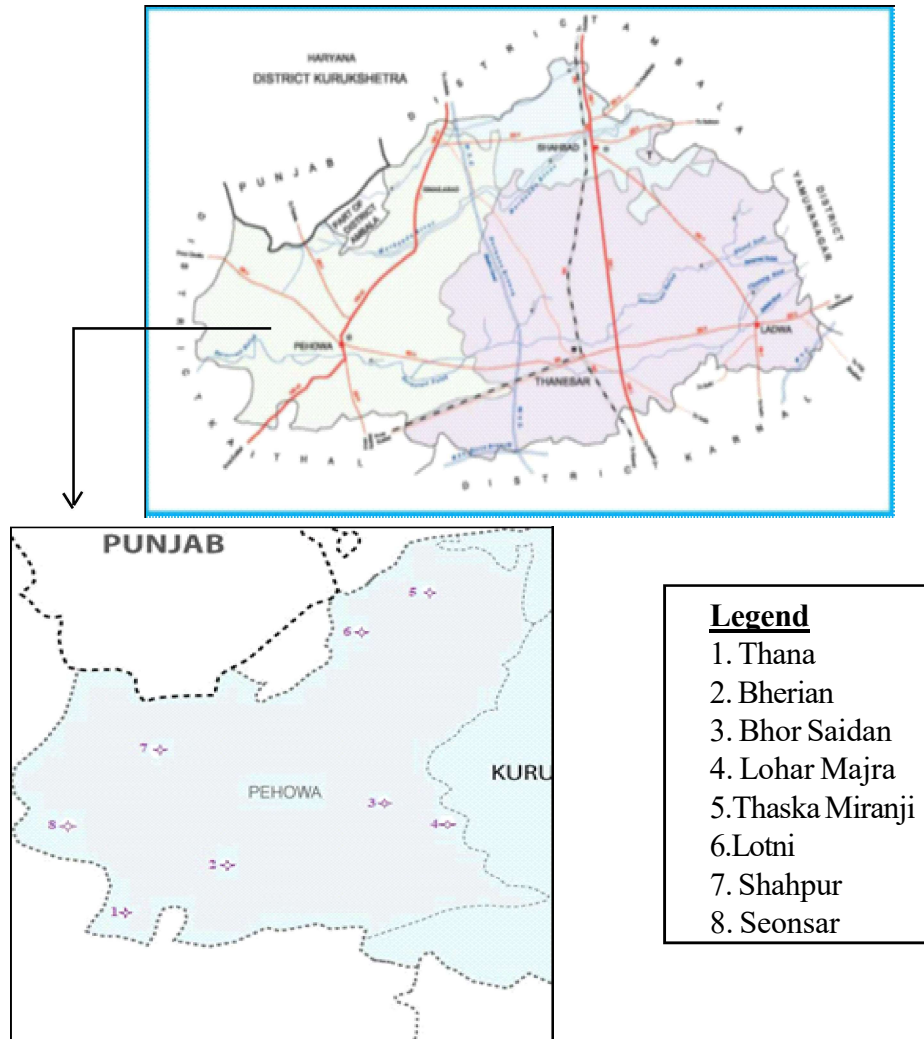


Fig. 1. Map showing the location of sampling sites in Tehsil Pehowa, District Kurukshetra, Haryana (India)

Sampling Method

From March 2023 to November 2023, fortnightly field visits were conducted for the butterfly survey in Tehsil Pehowa and its nearby villages following Pollard walk method (Pollard and Yates, 1993) and Random Sampling Method. In Pollard walk method, appropriate transect routes were established in the selected sites and butterflies were observed within the range of 2.5m on each side of the transect, while walking at a steady pace. Butterflies

were counted directly during the peak activity hours from 7:00 A.M. to 11:00 A.M. in the morning and 2:00 P.M. to 6:00 P.M in the evening. Photographs were captured using Canon SX50HS camera. The taxonomic position representing the family, genus, common and scientific name of each recorded butterfly species were assigned using field guides of Kunte (2000), Kehimkar (2008) and Smetacek (2017), accordingly a checklist of the identified species was prepared. On the basis of abundance, butterflies were categorized under different score classes such as 80-100% of survey days as Abundant (A), 60-80% as Common (C), 40-60% as Occasional (O) and 20-40% as Rare (R) (Rajagopal *et al.*, 2011). The seasonality of the butterflies were also analysed according to the seasons i.e. Summer (March-May), Monsoon (June-August) and Post Monsoon (September-November).

RESULTS AND DISCUSSION

During the study a total of 25 species of butterflies in 22 genera, belonging to five families were recorded (Table 1). The family Lycaenidae dominated with 8 species, followed by Pieridae with 7 species; Nymphalidae with 5 species; Hesperidae with 3 species and least dominated by family Papilionidae with 2 species (Fig. 2). The status of butterflies based on occurrence revealed that 2 species were abundant, 4 were common, 9 were occasional and 10 were rare (Fig. 3).

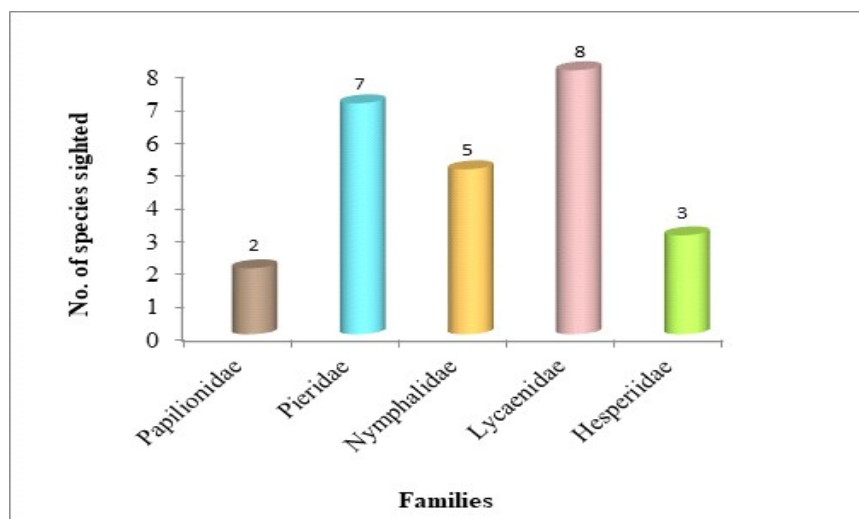


Fig. 2. Community structure and species composition of butterflies recorded from Tehsil Pehowa, District Kurukshetra.

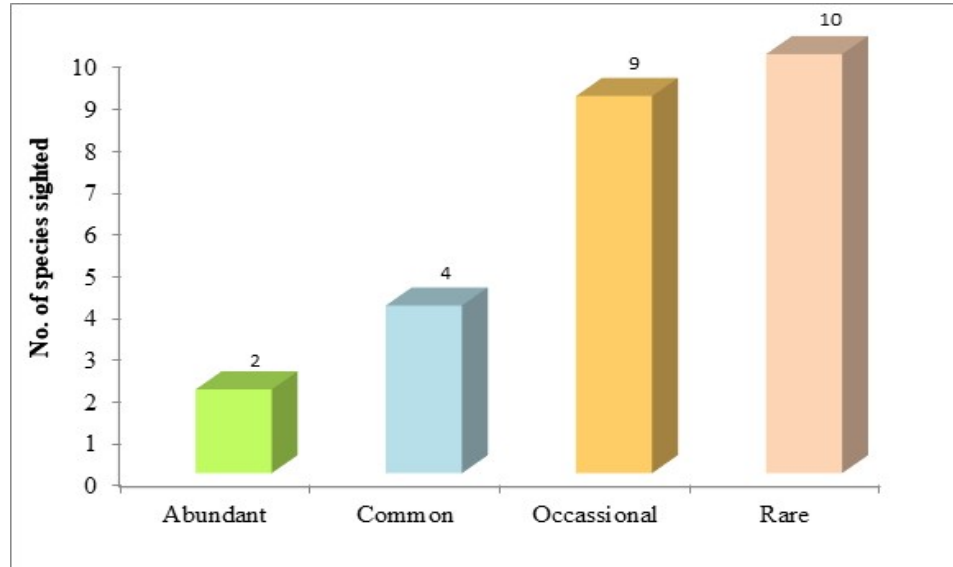


Fig. 3. Local abundance status of butterfly fauna recorded from Tehsil Pehowa, District Kurukshetra.

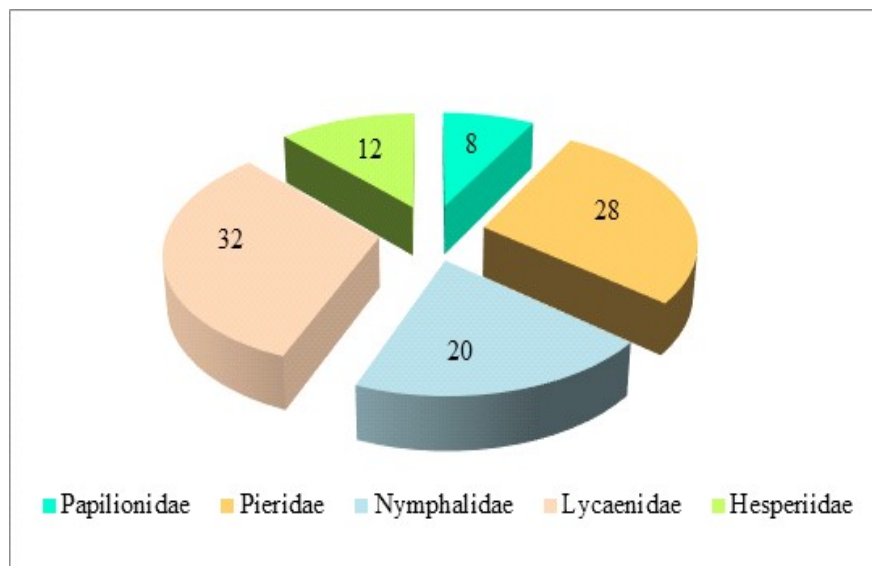


Fig. 4. Relative Diversity Index (RDi) of butterfly families recorded in selected study area.

Table 1. Checklist of Butterfly species recorded at Tehsil Pehowa, District Kurukshetra

Sr. No.	Common Name	Scientific Name	Abundance Status (A/C/O/R)
1. FAMILY PAPILIONIDAE (No. of Sub Family-1, No. of species-2)			
1.1. Sub Family Papilioninae			
1	Common Jay	<i>Graphium doson</i>	R
2	Lime Butterfly	<i>Papilio demoleus</i>	C
2. FAMILY PIERIDAE (No. of Sub Family-2, No. of species-7)			
2.1. Sub Family Coliadinae			
3	Common Emigrant	<i>Catopsilia pomona</i>	C
4	Mottled Emigrant	<i>Catopsilia pyranthe</i>	A
5	Common Grass Yellow	<i>Eurema hecabe</i>	O
2.2. Sub Family Pierinae			
6	Pioneer	<i>Belenois aurota</i>	R
7	White Orange Tip	<i>Ixias marianne</i>	O
8	Indian Cabbage White	<i>Pieris canidia</i>	O
9	Common Gull	<i>Cepore nerissa</i>	O
3. FAMILY NYMPHALIDAE (No. of Sub Family-3, No. of species-5)			
3.1. Sub Family Nymphalinae			
10	Peacock Pancy	<i>Junonia almana</i>	A
11	Danaid Eggfly	<i>Hypolimnas misippus</i>	R
3.2. Sub Family Biblidinae			
12	Common Castor	<i>Ariadne merione</i>	C
3.3. Sub Family Danainae			
13	Plain Tiger	<i>Danaus chrysippus</i>	O
14	Striped Tiger	<i>Danaus genutia</i>	R
4. FAMILY LYCAENIDAE (No. of Sub Family-1, No. of species-8)			
4.1. Sub Family Polyommatainae			
15	Dark Grass Blue	<i>Zizeeria karsandra</i>	C
16	Lesser Grass Blue	<i>Zizina otis</i>	O
17	Small Cupid	<i>Chilades parrhasius</i>	O
18	Plains Cupid	<i>Chilades pandava</i>	O
19	Striped Pierrot	<i>Tarucus nara</i>	O
20	Forget-me-not	<i>Catochrysops strabo</i>	R
21	African Babul Blue	<i>Azonus jesous</i>	R
22	Zebra Blue	<i>Leptotes plinius</i>	R
5. FAMILY HESPERIIDAE (No. of Sub Family-2, No. of species-3)			
5.1. Sub Family Hesperinae			
23	Large Branded Swift	<i>Pelopidas subochracea</i>	R
24	Grass Demon	<i>Udaspes folus</i>	R
5.2. Sub Family Coeliadinae			
25	Common Banded Awl	<i>Hasora chromus</i>	R

During the study, the seasonality in the occurrence of different butterfly species was also recorded. The number of species encountered was highest during Post Monsoon i.e. 24 species, decreased to 21 in monsoon and 18 during the summer. Variations in the abundance and distribution of butterfly species were found consistently highest in Family Lycaenidae between summer and other two seasons. In Family Nymphalidae, equal number of species was observed in post monsoon and summer. Among the Family Pieridae it was inconsistent across seasons, being high in post monsoon, summer and low in monsoon. Among Family Papilionidae, no variation was observed during the seasons. Among Hesperidae, consistent variation was seen between post monsoon and other two seasons (Fig. 5).

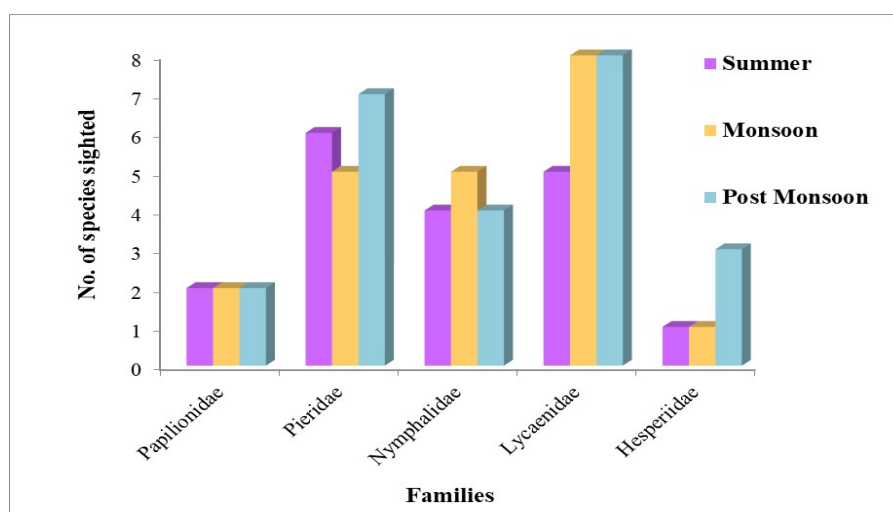


Fig. 5. Family wise seasonal variations of Butterfly species observed in Tehsil Pehowa, District Kurukshetra.

The preservation of the habitat is crucial as butterflies are specific to certain types of habitat and food plants. Strive to strike a balance between development and conservation in order to prevent habitat loss brought on by various human interferences. Measures such as planting forestry and food plants, which are ideal for their sustenance, should be commenced.

However, in order to utilize the knowledge, one must first needs to develop baseline particulars. The current available information about the butterfly fauna of Haryana is limited and primarily derived from the expertise of amateur naturalists and opportunistic scientists. Well-thought-out and comprehensive surveys would manifold their diversity.

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