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Butterfly abundance is determined by food availability of Jayantikunj, Rewa Madhya Pradesh

Pinky Suryawanshi, Sandeep Shaky
Guest Lecturer Zoology, Govt. College, Amarwara, Chindwara, Madhya Pradesh, India

Abstract
The study was carried out different species of butterflies of the order Lepidoptera were collected from different localities of Jayantikunj, Rewa during months of October and November, 2017. A total of 1092 individuals of 59 species belonging to six families – Hesperiidae, Papilionidae, Pieridae, Nymphalidae, Lycaenidae and Riodinidae - were recorded in the survey. The relative abundance was highest for Nymphalidae (26 species, 44.1%) and lowest for Riodinidae (1 species, 1.7%). Nymphalidae was found to be the dominating family in study area with maximum individuals (465) and species (26) registered under this family. Food availability could be the factor that is limiting the increase of specialist butterflies at the same rate as the generalist butterfly species.

Keywords: butterfly; abundance, food availability, Jayantikunj

1. Introduction

Butterfly gardening is designed to create an environment that attracts butterflies, as well as certain moths. Butterfly gardening is often aimed at inviting those butterflies and moths to lay eggs as well. Because some plants are not fed upon by adult butterflies, the caterpillar host should also be planted for a bigger population of butterflies. Butterflies typically feed on the nectar of flowers, and there are hundreds of such plants that may be planted to attract them, depending on the location, time of year, and other factors. In addition to the planting of flowers that feed butterflies, other means of attracting them include constructing "butterfly houses", providing sand for puddling, water, and other resources or food items, including rotten fruit.

Some people only like to look at the butterflies, while others like to take pictures as well. Others try to help the butterfly population by planting native plants which rare or threatened butterflies feed on. Done correctly, butterfly gardening can increase the populations of butterflies. Many butterflies are becoming less abundant as a result of habitat destruction and fragmentation, and they do not feed on the plants regularly found in gardens. Others may also help in tagging monarch butterflies, which helps scientists monitor the monarch population and their migratory routes. Butterflies also serve as flower pollinators and attracting the butterflies can also assist in the pollination of nearby plants. Typically, flowers of plants that attract butterflies also attract other insect pollinators. Butterfly gardening can also serve as an educational opportunity for children and can be a relatively safe way to introduce them to the natural world.

India is home to about 1504 species of butterflies (Tiple, 2011) [1] which is about 8.74% of total butterfly species of world and constitute 65% of total Indian fauna. Different species of butterfly are supported by different ecosystems of our country. Many studies have been documented on the butterflies of central India starting from 1880s (Forsayeth, 1884; Betham, 1890, 1891) [2-4]. 177 species were recorded by D'Abreu in 1931[5] in the erstwhile Central Provinces which are now Madhya Pradesh and Vidarbha.

The adult butterflies act as pollinators and help in pollination of many native plants. To a large extent, butterflies (being a pollinating agent) contribute to the growth, maintenance and expansion of flora in the tropical regions where these insects show high abundance and species diversity (Bonebrake *et al.*, 2010) [6]. For many predators like birds, lizards these butterflies both in larvae and adult stage act as their prey species. In the present day scenario, due to fragmentation of habitat and depletion of natural cover many species of butterfly are facing threat to their existence. For assessing large scale biodiversity trends, it's important to keep assessing the change in their abundance and distribution.

Butterflies are providing the best rapid indicators of habit quality and they are the sensitive indicators of climatic change (Venkata Ramana, 2010) [7]. In the world, about 19,238 species were documented by Heppner (1998) [8]. There were about 1,504 species of butterflies in Indian subcontinent (Gaonkar, 1996[9]; Smetacek, 1992[10]). In central India, about 177 species of butterflies were reported in the Central Provinces (Vidarbha, Madhya Pradesh and Chattisgarh) by D'Abreau (1931) [5]. In Vidarbha region, Tiple (2011) [1] was compiled and records of 167 species of butterflies belonging to 90 genera representing 5 families.

Appropriate abiotic and biotic factors such as climate condition, temperature and wind exposure, availability of host and larval plants (Barlow *et al.*, 2007) [11], food and vegetation (Ravindra *et al.*, 1996; Kharat et al., 2012; Kumaraswamy & Kunte, 2013) [12-14], topographic features (Amala *et al.*, 2011) [15], habitat quality (Barlow *et al.*, 2007) [11] are some of the most important parameters to determine butterfly composition in a community. The present study was conducted to estimate diversity and habitat association of butterfly community across four different habitat types along Jayantikunj, Rewa

(M.P.).

Rewa city is important on account of its location in the midest of the district area, where rich mineral deposits are found. There are thick forest in the vicinity of Rewa Distt. The city is located on the plateau surrounded by plane land and villages; the average elevation above mean sea level is 1430 ft.

The investigation was conducted at the Jayantikunj, Rewa (M.P.). It is situated at the western site of Govt. Science College Hostel, Rewa (M.P.). It is about 0.023 hectares. In Jayantikunj rare, vulnurable, medicinal and Threatned species of plants were planted in the nursery for selling. Besides planted trees, a variety of annual wild plants and perennial shrubs grow naturally in this area. The minimum temperature in winter 0-9^{0}C and the maximum temperature in summer is 38^{0}C to 43^{0}C. The climate of the area is subtropical with not summer and tropical with cold winters. Since, the main objective of this study has been conduct preliminary observation of butterflies and carried out the checklist, occurrence and richness inhibiting the Jayantikunj, Rewa (M.P.).

2. Material and Methods

The study was carried out during morning from 7 am to 10 am. Observations were made through walking transects (Pollard, 1993 [16]; Caldas and Robbins, 2003 [17]) of 0.5 km to 0.7 km length with 2 m to 5 m on either side. The present study is based on 4 line transects to study the butterfly population. The sites were visited in morning and evening hours to note maximum possible species of butterflies and record its activities. The recorded species are identified with the help of photographs by using reference books and publications.

3. Result & Discussion

During study, species from 6 families were recorded, details about which can be found in Table 1. The status of different families on the basis of their count can be seen in fig 1 shows percentage of each category in the Jayantikunj, Rewa.

Table 1: Total number and percentage of genera, species and individuals in different family at Jayantikunj.

S. No	Family	Genus	Species	Individuals
1.	Hesperiidae	6 (13.6%)	6 (10.2%)	34 (3.1%)
2.	Papilionidae	4 (9.1%)	4 (6.8%)	49 (4.5%)
3.	Pieridae	6 (13.6%)	9 (15.3%)	357 (32.7%)
4.	Nymphalidae	16 (36.4%)	26 (44.1%)	465 (42.6%)
5.	Lycaenidae	11 (25%)	13 (22%)	177 (16.2%)
6.	Riodinidae	1 (2.3%)	1 (1.7%)	10 (0.9%)
Total		44	59	1092

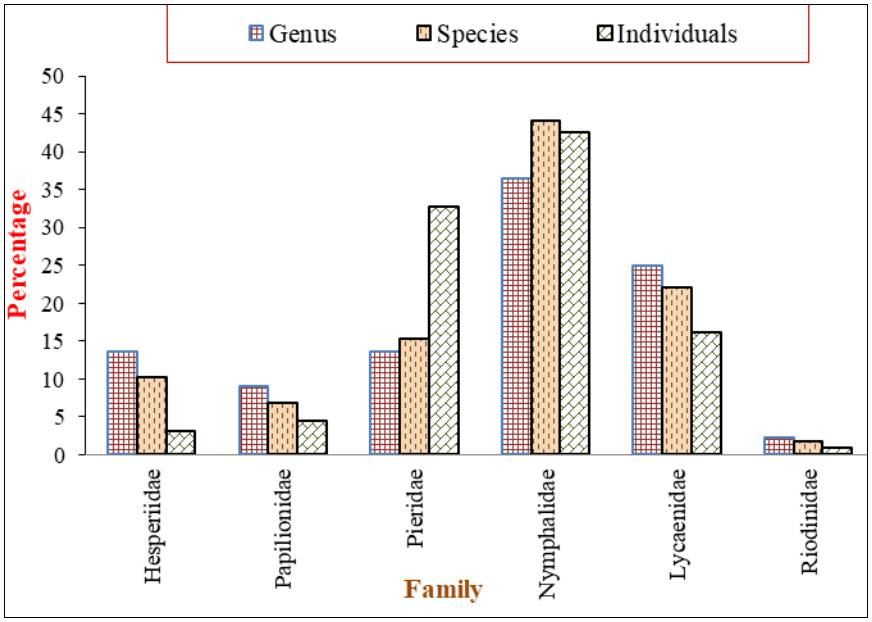

Fig 1: Graphics analysis of percentage of genera, special and indiviuals I different family at Jayantikunj

During the survey, a total of 1092 individuals of 59 species of butterfly belonging to 44 genera and 6 families were recorded from four habitat types of corridor. Occurrence of maximum number of species was recorded in the family Nymphalidae and Lycaenidae which could be attributed to the presence of their larval and host plants.

Among the families Nymphalidae was dominant in terms of species composition and abundance with 26 species covering about 44.1% of all the species in area followed by Lycaenidae (13 species, 22%), Pieridae (9 species, 15.3%), Hesperiidae (6 species, 10.2%), Papilionidae (4 species, 6.8%) and Riodinidae (1 species, 1.7%). Out of 1092 individuals 465 individuals were identified from Nymphalidae family followed by Pieridae with 357 individuals, Lycaenidae with 177 members, Papilionidae with 49 individuals, Hesperiidae with 34 individuals and least 10 individuals were recorded in Riodinidae family. Total 44 genera were identified during study with Nymphalidae (16 genera, 36.4%) being the dominant one followed by Lycaenidae (11 genera, 25%), Hesperiidae and Pieridae (both 6 genera, 13.6%), Papilionidae (4 genera, 9.1%) and least in Riodinidae family with 1 genera (2.3%)

Food availability could be the factor that is limiting the increase of specialist butterflies at the same rate as the generalist butterfly species. Grassland coverage could be an important factor, which may have strong effects on the species composition (the species of butterfly found at Jayantikunj) of butterfly assemblages. Similarly, this also suggests that specialist species might be affected by a decrease in the plant species diversity.

Many studies have documented the dominance shown by members of the Nymphalidae family in tropical region owing to its polyphagous nature which helps to inhabit all the habitats (Parasharya, 2007) [18]. They are also comparatively more strong, good and active fliers that can search a large area for resources (Eswaran & Pramod 2005; Krishnakumar *et al.*, 2007; Raut & Pendharkar 2010; Padhye *et al.*, 2006) [19-22]. It avoids shade and dense vegetation but frequents openings in all vegetation types, including clearing in evergreen forest (Mali *et al.*, 2014) [23].

4. Conclusion

The butterfly species being a good indicator of health of their environment can become an ideal subject for this purpose. In present scenario, many butterfly species have already become endangered and extinct. In order to understand their present ecological status and need, it is very important to conduct studies which will not only assess their population status in their natural settings but will also evaluate whether these species can thrive in man-made structures.

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6. References

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