Article

A report on butterfly diversity of Rawanwadi Reservoir, Bhandara (Maharashtra), India

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Abstract

Investigations have been done to record diversity of butterflies around the area of Rawanwadi reservoir during April 2015 to March 2016. It is surrounded by hilly terrain and forest provides abundance of host and larvalfood plants, and vegetation which are the most dominant features for diversity of butterflies. It has abundant species of butterflies due to suitable surrounding environment. A total of 84 species belonging to 5 families and 54 genera were recorded. Amongst which 52.38% were common, 28.57% were occasional and 19.04% species were rare. Family Nymphalidae consist maximum number of species i.e. 32 from 19 genera. This number is followed by Lycaenidae with 19 genera and 26 species. Pieridae consist of 13 species of 7 genera and Hesperiidae consist 7 species of 6 genera. Minimum number of species were recorded in Papilionidae i.e. 6 species of 3 genera. Most species from Lycaenidae were found near water body.

Keywords butterflies;diversity;Rawanwadi.

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1 Introduction

Among insects, butterflies are the most eminent group and they occupy a vital position in ecosystem. Their presence and diversity is considered to be a sign of good condition of any terrestrial biotope (Aluri and Rao, 2002). Because of this, they are also considered as an ideal subject for ecological condition of landscape (Thomas and Malorie, 1985). They are also very sensitive indicators of climatic change (VenkatRaman, 2010). Most of the butterflies are strictly seasonal and they prefer only a particular type of habitat (Kunte, 1997).

Butterflies are beautiful and delicately coloured winged Insect. They have always fascinated common man because of their delicacy and beauty (Arya et al., 2014). The exquisite colour pattern of butterfly wings helps them to protect from predators by mimicking the background. These are also act as pollinators for many native plants and in tropical regions, where there is abundance and great diversity of butterflies; they contribute to growth, expansion and maintenance of flora being a pollinator (Bonebrake et al., 2010).The abundance and

diversity of butterflies depend upon several factors such as availability of host and larval food plants, vegetation, tropical features etc. Since butterflies are dependent on these factors, disturbance in any of the above will directly affect their status.

Heppner (1998) documented 19238 species of butterflies in the world. Later, Gaonkar (1996) reported 1504 species in Indian subcontinent. D'Abreau (1931) reported about 177 species of butterflies in Central Provinces. Tiple (2011) recorded a total of 167 species of 90 genera from Vidarbha region.A total of 92species of butterflies were reported in Gorewada International Biopark situated in Central India (Patil and Shende, 2014).

The present study was carried out in and around Rawanwadi reservoir, Bhandara. It was constructed as irrigation project by Maharashtra Government in 1960. Rawanwadi reservoir along with surrounding hilly terrain and forest provides abundance of host and larval food plants, vegetation and tropical features which are the most dominant features for diversity of butterflies observed in there. It is also a developing tourist spot for visitors. But deforestation and increased human activities in area have resulted into loss of habitat for most of the local species diversity. The abundance of water and plants has provided very good habitat for many fishes, insects, amphibian, reptiles, birds etc.

The aim of current study is to find out the current status of butterflies in Rawanwadi reservoir and to prepare a checklist of butterflies of this region for the purpose of conservation of indigenous species present in this area.

2 Study Area

The present study has been carried out in and around Rawanwadi reservoir (Fig. 1). Its geographical location is and around 21.043197 N, 79.729924 E. The region is lies in the Wainganga River belts near Gosekhurd dam of Central India. Rawanwadi dam is surrounded by hilly terrain and forest. It has abundant species richness due to suitable surrounding environment. The water body provides good habitat for many fishes, amphibian, odonates, etc., whereas the surrounding forest is a good habitat for bird, reptiles and other animals.

Fig. 1 Map to show line transacts at study area of Rawanwadi, Dist. Bhandara Maharashtra, India (P.C. Google maps)

3 Material and Methods

The butterfly diversity has been recorded during the months of April 2015 to March 2016. Butterfly observation has been done in such a way that there should be at least two visits per month at the site. The photographs were done with the help of digital cameras Canon 700D, Sony cyber shot, Sony handicam 3.1 MP, Nikon Coolpix.

The observations through walking transect (Pollard and Yates, 1993) of 0.5 to 0.7 km length with 2m to 5m on each side. The study was carried out during 7:00 am to 11:00 am in and 2:00 pm to 6:00 pm. The photographs taken in the field were later identified and studied with the help of available keys, reference books and publications. The list of butterfly genera and species were derived from Antram (1924), Evans (1927), Pandharipande (1990), Gaonkar (1996), Tiple (2011) and Patiland Shende (2014). On the basis of occurrence, butterfly species were divided into 3 categories: Common (C), Occasional (O) and Rare (R).

4 Results

A checklist of butterflies of Rawanwadi dam and reservoir was made based on present study. A total of 84 species were recorded from5 families and 54 genera (Table 1). Among these families, Nymphalidae consist maximum number of species i.e. 32 from 19 genera. This number is followed by Lycaenidae with 19 genera and 26 species. Pieridae consist of 13 species of 7 genera and Hesperiidae consist 7 species of 6 genera. Minimum number of species were recorded in Papilionidae, i.e. 6 species of 3 genera (Table 3 and Fig. 3).

In present report, out of 84 species, 44 (52.38%) species are common, 24 (28.57%) are occasional and 16 (19.04%) are rare (Table 2 and Fig. 2). The declining status of butterflies may be due to loss of habitat for butterflies. Increased human activities might also affect number of butterflies around the study area. The abundance of butterflies was observed where the vegetation was dense with majority of host and larval food plants. Most species from Lycaenidae were found near water body.

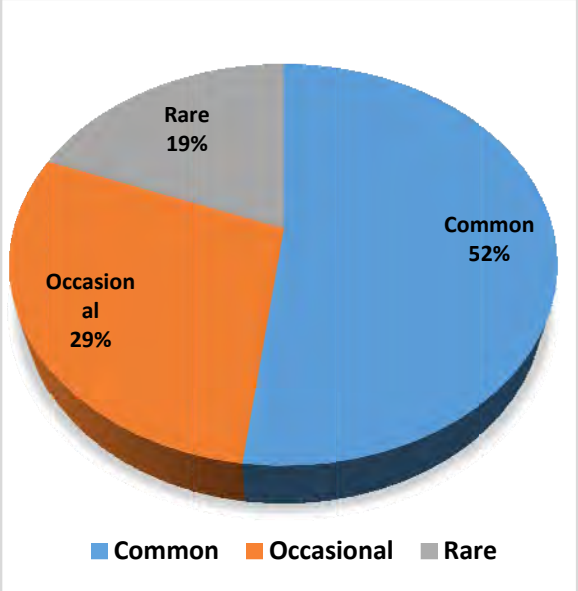

Fig. 2 Status of butterflies.

Table 1 A checklist of butterflies of Rawanwadi reservoir.

Serial No.	Generic name	Common name	Status	Family
1.	*Graphium agamemnon*	Tailed jay	C	**Papilionidae Genera:03 Species:06**
2.	*Graphium doson*	Common jay	C	
3.	*Pachliopta aristolochiae*	Common rose	C	
4.	*Pachliopta hector*	Crimson rose	O	
5.	*Papilio demoleus*	Lime butterfly	C	
6.	*Papilio polytus*	Common Mormon	O	
7.	*Anaphaeis aurota*	Pioneer	C	**Pieridae Genera:07 Species:13**
8.	*Appias albino*	Common albatros	O	
9.	*Appias libythea*	Eastern stripped albatross	O	
10.	*Catopsila pomona*	Lemon emigrant	C	
11.	*Catopsila pyranthe*	Mottled emigrant	C	
12.	*Cepora nerissa*	Common gull	C	
13.	*Delias eucharis*	Common jazebel	R	
14.	*Eurema andersonii*	One spot grass yellow	C	
15.	*Eurema blanda*	Three spot grass yellow	O	
16.	*Eurema briggitta*	Small grass yellow	C	
17.	*Eurema hecabe*	Common grass yellow	C	
18.	*Eurema laeta*	Spotless grass yellow	R	
19.	*Pareromia valeri*	Common wanderer	C	
20.	*Acraea violae*	Tawny coster	C	**Nymphalidae Genera:19 Species:32**
21.	*Ariandne ariandne*	Angled castor	C	
22.	*Ariandne merione*	Common castor	C	
23.	*Byblia ilithyia*	Jocker	R	
24.	*Charaxes polyxena*	Tawny rajah	R	
25.	*Charaxes solon*	Black rajah	R	
26.	*Danaus chrysippus*	Plain tiger	C	
27.	*Danaus geutia*	Striped tiger	C	
28.	*Elymnias hypermnestra*	Common palmfly	R	
29.	*Euploea core*	Common Indian crow	C	
30.	*Euploea klugii*	Brown king crow	O	
31.	*Euthalia aconthea*	Common baron	O	
32.	*Heteropsis malasara*	White line bushbrown	R	
33.	*Hypolimnas bolina*	Great eggfly	C	
34.	*Hypolimnas misippus*	Danaid eggfly	C	
35.	*Junonia almanac*	Peacock pansy	C	
36.	*Junonia atlites*	Grey pansy	C	
37.	*Junonia hierta*	Yellow pansy	C	
38.	*Junonia iphita*	Chocolate pansy	C	
39.	*Junonia lemonia*	Lemon pansy	C	
40.	*Junonia orithya*	Blue pansy	C	
41.	*Melanitis leda*	Common evening brown	C	
42.	*Melanitis phedima*	Dark evening brown	O	
43.	*Melanitis zitenius*	Great evening brown	O	
44.	*Mycalesis mineus*	Dark branded bushbrown	O	
45.	*Mycalesis perseus*	Common bushbrown	C	
46.	*Neptis hylas*	Common sailer	C	
47.	*Parantica aglea*	Glassy tiger	O	
48.	*Phalanta phalantha*	Common leopard	R	
49.	*Symphae dranais*	Baronet butterfly	C	
50.	*Tirumala limniace*	Blue tiger	C	
51.	*Ypthima asterope*	Common three ring	R	
52.	*Acytolepis puspa*	Common hedge blue	C	**Lycaenidae Genera: 19 Species: 26**
53.	*Amblypochia anitadina*	Indian purple leaf blue	R	
54.	*Arhopala pseudocentaurus*	Western centaur oak blue	R	
55.	*Azanus jesous*	African babul blue	O	
56.	*Azanus ubaldus*	Bright babul blue	R	
57.	*Castalius rosimon*	Common pierrot	C	
58.	*Catochrysops panormus*	Silver forget me not	O	
59.	*Catochrysops strabo*	Forget me not	C	
60.	*Chilades laius*	Lime blue	O	

61.	*Chilades pandava*	Plain cupid	C	
62.	*Chilades parrhasius*	Small cupid	O	
63.	*Chilades trochylus*	Grass jewel	C	
64.	*Euchrysops cnejus*	Gram blue	O	
65.	*Jamides bochus*	Dark cerulean	R	
66.	*Jamides celeno*	Common cerulean	C	
67.	*Lampides boeticus*	Pea blue	O	
68.	*Leptotes plinius*	Zebra blue	C	
69.	*Prosotas nora*	Common line blue	C	
70.	*Pseudozizeeria maha*	Pale grass blue	R	
71.	*Spindasis vulcanus*	Common silverline	O	
72.	*Surendra quercetorum*	Common acacia blue	O	
73.	*Tarucus nara*	Rounded pierrot	C	
74.	*Virachola isocrates*	Common guava blue	R	
75.	*Zizeeria karsandra*	Dark grass blue	C	
76.	*Zizina otis*	Lesser grass blue	C	
77.	*Zizula hylax*	Tiny grass blue	C	
78.	*Badamia exclamationis*	Brown awl	O	**Hesperiidae Genera: 06 Species: 07**
79.	*Barbo cinnara*	Rice swift	C	
80.	*Oriens goloides*	Common Indian darlet	O	
81.	*Pelopidas mathias*	Small branded swift	O	
82.	*Pelopidas subochracea*	Large branded swift	O	
83.	*Saustus gremius*	Palm bob	O	
84.	*Spialia galba*	Indian grizzled skipper	R	
Total	**Genera: 54**	**Species: 84**		**Family: 5**

Abbreviations: **C**-Common, **O**-Occasional, **R**-Rare.

Table 2 Status of butterflies of Rawanwadi.

Serial No.	Status	Number of species	%age of species
1	Common	44	52.38
2	Occasional	24	28.57
3	Rare	16	19.04
Total		**84**	**100**

Table 3 Genera and species distribution in respective families of butterflies.

Serial No.	Family	No. of genera	No. of species
1	Papilionidae	03	06
2	Pieridae	07	13
3	Nymphalidae	19	32
4	Lycaenidae	19	26
5	Hesperiidae	06	07
Total	**05**	**54**	**84**

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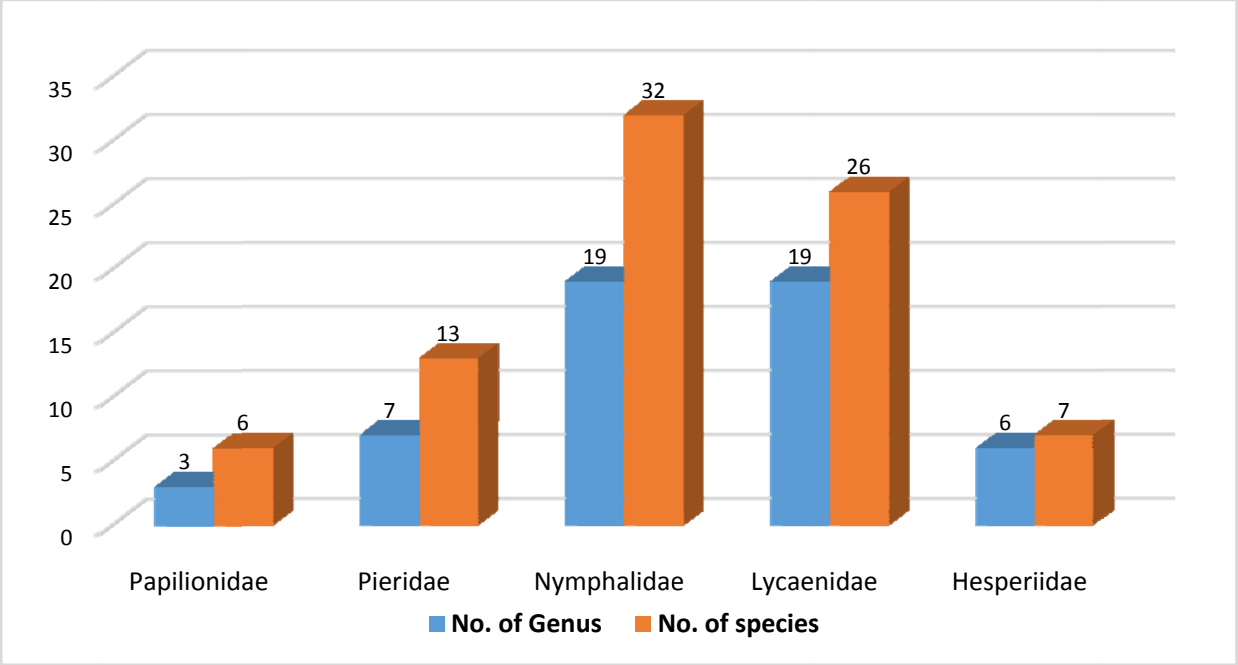

Fig. 3 Distribution of different genera and species in respective families.

5 Discussion

Work on butterfly diversity in central India was done earlier by Forsayeth (1884), Swinhoe (1886), Betham (1891) and Witt (1909). Evans (1932), Talbot (1939) Wynter-Blyth (1957) has also documented some diversity from Madhya Pradesh and Chhattisgarh. D'Abreau (1931) reported 92 form Nagpur region, Central Provinces. Later in 2014, Patil and Shende have reported 92 species of 59 genera from Gorewada International Bio Park, Nagpur Central India.

In present study, a total of 84 species were recorded from 5 families and 55 genera. Family Nymphalidae was found to contain maximum number of species (32) and genera (19). Lycaenidae contains 26 species of 19 genera;Pieridae contains 13 species of 7 genera. Hesperiidae has only 7 species of 6 genera whereas least species were recorded in Papilionidae, 6 species of 3 genera. Harsh et al. (2015) reported 59 species of 44 genera from Kanha Pench region, Madhya Pradesh. Deokarand Shukla (2015) reported a total of 65 species of 46 genera at Kolamarka Conservation Reserve, Central Maharashtra. Murugesan and Muthusamy (2011) reported 103 butterfly species of 5 families in Western Ghat. Tiple (2011) recorded 167 species of butterflies in Vidarbha region in which Nymphalidae was the most dominant family consisting 50 species followed by Lycaenidae with 47 species. Hesperiidae have 34 species, Pieridae with 20 species and Papilionidae with 34 species. Nymphalidae is seen to be the most dominant family in Vidarbha region whereas Pieridae is the least dominant one.

The dominance of Nymphalidae in tropical region is being documented by many researchers. This is because their polyphagous nature which helps them to inhabit in all habitat. Their dominance is also because of their active flying nature and they can search a large area for resources (Forsayeth, 1884).

With reference to previous studies, most of the observations of present study are similar. The differences in current study and previous studies may be because of some limitation like, restricted entry in forest area due to presence of beasts, limitation of camera range (which enable photography only up to a certain distance),

limited visits on study area etc. Apart from these, the differences observed may be because of climatic and geographical variation of the place.

6 Conclusions

The present study concludes with systematically studied butterfly biodiversity checklist which will be useful for the conservation of wide range of endangered species of the area. Family Nymphalidae is the most dominant one followed by Lycaenidae, Pieridae and Hesperiidaewhile Papilionidae is least dominant in Rawanwadi.

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