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Species Diversity of Butterflies in Durg-Bhilai City Area

Abstract

A study was conducted during 2012-14 to configure species diversity of butterflies in Durg-Bhilai city area of Chhattisgarh state. Total numbers of families observed were 05 (Nymphalidae, Papilionidae, Lycaenidae, Pieridae, Hesperidae). A total 67 species belonging to 38 genera were observed. Species richness was more in Bhilai township area than Durg city. Seasonal variation was also observed during the study.

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Introduction

Lepidoptera is one of the most widespread and widely recognized orders of class insect in the world. Order Lepidoptera is grouped in 08 families- Nymphalidae, Papilionidae, Lycaenidae, Pieridae, Hesperidae, Megathymidae, Libytheidae and Nemeobiidae. From Indian sub-region about 1,504 species of butterflies are reported (Kunte 2009). Out of these 351 are from peninsular India and 334 from Western Ghats. D'Abreu (1931) reported a total 177 species of butterflies from central India. At that time the region was called the Central Province (now Madhya Pradesh, Chhattisgarh & Vidarbha). Peninsular India, Western Ghats and Himalayan region are hot spots for richness of butterflies species diversity.

Butterflies are nectar feeding insects. They are important member of food chain, supporting a wide range of predators and parasites. They are important pollinators in the ecosystem. They are favorite model for scientific research on habitat loss and fragmentation, climate change, navigation, pest control, embryology, mimicry, evolution genetics, population dynamics and biodiversity conservation.

Though butterflies are widely studied group, not much work has been done regarding butterflies species diversity in Chhattisgarh state. There is no specific literature about butterflies of Chhattisgarh. Also the local list of butterfly species at regional or city level is very less. Present study is a very small step in configuring the species diversity and seasonal variation of the butterflies of the region.

Durg- Bhilai area has so many industries in and around the city such as iron and steel industries, cement factory and rice mills. Occurrence, abundance and diversity of butterflies are considered as an important indicator of the health of ecosystem and environment. Durg-Bhilai region falls in the relatively species poor drier region of central India. Present study is focused on the observation of butterfly species diversity in different seasons in Durg-Bhilai city area. The study is carried out during 2012-2014.

Methodology

Survey and observation was carried out in Durg-Bhilai city area at ten different spots between 8 to 10 am in the morning and 3 to 5 pm in the evening for three days in a week from June 2012 to May 2014. Spots were selected according to the maximum availability of butterfly species. Butterflies were observed and identified directly in the field or some times after photography. Largest numbers of genera were from the family Nymphalidae (15) followed by Lycaenidae (13), Pieridae (05), Papilionidae (03) and Hesperidae (02). Largest number of species are from Nymphalidae (25) followed by Lycaenidae and papilionidae(14 each), Pieridae(12) and Hesperidae (02).

Result and Discussion

Total numbers of families observed were 05 (Nymphalidae, Papilionidae, Lycaenidae, Pieridae, Hesperidae). Total numbers of species observed were 67 belonging to 38 genera. Largest numbers of genera were from family Nymphalidae (15) followed by Lycaenidae (13), Pieridae (05), Papilionidae (03) and Hesperidae (02). Largest number of species were from Nymphalidae (25) followed by Lycaenidae and papilionidae (14

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each), Pieridae (12) and Hesperidae (02). Species richness was more in Bhilai township area than Durg city.

Species of butterflies belonging to five families, Nymphalidae (37.31%), Papilionidae (20.89%), Lycaenidae (20.89%), Pieridae (17.91%) and Hesperidae (2.98%) were observed. Total sixty seven species and thirty eight genera were observed. Out of these some species were common throughout the year. Plain Tiger (*D.chrysippus*), Common tiger (*D.plexipus*) and Common Indian crow (*E.core*), Double branded crow (*E.sylvester*) of family Nymphalidae, Common mormon (*P.polytes*), The red helen (*P.heleanus*) and Lime butterfly (*P.demoleus*) of family Papilionidae, Tiny grass jewel (*Z.hylax*), Little blue (*C.minimus*), Dark grass blue (*Z.karsendra*), Lesser grass blue (*Z.otis*) of family Lycaenidae, African emigrant (*C.florella*), Lemon emigrants (*C.pomona*) and Mottled migrants (*C.pyranthe*) of family Pieridae were observed very commonly. Whereas some other species such as Veined jay (*G.chiron*) and Great Jay (*G.eurypylus*), Malabar rose (*P.pandiayana*) of family Papilionidae, Pale Grass blue (*P.maha*), Three spotted Grass yellow (*E.blanda*) and Tree yellow (*G.harina*) of family Pieridae and members of family Hesperidae were most uncommon.

Family Nymphalidae and Papilionidae attained maximum species richness during month of October to December (the end of the rainy season and the winter season). Family Lycaenidae showed maximum species richness during the month of November to March (winter season). Family Pieridae showed maximum number during monsoon to late winter.

As far as richness of species is concerned in Bhilai township area all 67 species were seen. In Durg city area only 52 species and 32 genera were seen. The species which were not observed in Durg city area were common striped tiger (*D. genutia*) Blue spotted crow (*E. midemus*) Grey Pancy (*J.atlites*) Indian fritillary (*A. hyperbius*) Dark Branded bush brown (*M. minemus*) Southern duffer (*D. lepida*), Common jester (*S. lilaea*), Egg fly (*H. bolina*) Indian leopard (*P. phalenta*) from family Nymphalidae. The genera *Discophora*, *Symbrenthia*, *Hiplimnas* and *Phalenta* were in Bhilai area and not in Durg city area. Crimson rose (*P. hector*), Tailed jay (*G. agememnon*), Blue jay (*G. evemon*) and Glassy blue bottle (*G. cloanthus*) from family Papilionidae were seen only in Bhilai town ship area. From family Pieridae Scarce grass yellow (*Colias croceus*) was found in Bhilai town ship area only. Gram blue (*Eurypsops cnejus*) was not seen in Durg city area. Only two genera and two species of family Hesperidae were found only in Durg city area These were not seen in Bhilai. Thus overall 15 species and 06 genera were seen only in Bhilai town ship area and not in Durg city area.

The overall population of butterfly is low in summer. Population showed two peak periods. It increased gradually from early monsoon to late monsoon. Highest population was seen during late monsoon. Thus the first peak was observed in the month of July-September. The second peak for

population was seen in winter months i.e. in the month of January and February.

D. Abreau (1931) reported 177 species of butterflies from then Central Provinces which included Madhya Pradesh, Chhattisgarh and Vidarbha area. Pandharipande et.al.(1990) reported 61 species of butterflies from Nagpur city. Kaneria et al. (2013) from Bilaspur city and nearby areas reported 51 species of which highest numbers of species were of family Nymphalidae followed by Lycaenidae, Pieridae, Papilionidae and Hesperidae same as in the present study. In the present study the total numbers of species found were 67, still the number is not very high. Species diversity is found low in the area probably because the area observed is small and also it is possible that a few butterfly species may have escaped unnoticed and might be added in future. Also the area studied is much smaller.

The populations are low in summer (Kunte 2001) probably due to scarcity of water and required flora or their larval food plants. Population richness was more in shrub dominated areas.

Abundance of butterflies fluctuated widely over the months and was most abundant in the area during the month of August and was lowest in May. The high peak in August was partly because of the high abundance of Pieridae (P.R. Arun, 2002).

The butterflies as most others Lepidoptera, show distinct patterns of habitat association. The nature of vegetation, sunshine availability of water etc., are the factors that determine the survival of a given species in a particular habitat (De Vries, 1987).

Increasing species abundance from the beginning of the monsoons (June-July) till early winter (August-November) and decline in species abundance from late winter (January-February) to the end of summer, Ashish D. Tiple (2012). It has also been reported by Tiple et al. (2007) and Tiple & Khurad (2009) in similar climatic conditions in this region of central India.

Number of genera and species observed at Bhilai is more, probably because of richness of vegetation in the area. There are number of avenues, public gardens, plantations and home gardens in Bhilai township area.

Table 1
Species diversity of family Papilionidae

Sr. No	Family	Genus	Species	Common Name
	Papilionidae			
1		Papilio	clytia	Common Mime
2			helenus	Red Helen
3			polytes	Common Mormon
4			demoleus	Common Lime butterfly
5		Pachliopta	aristolochiae	Common Rose
6			pandiana	Malabar Rose
7			hector	Crimson Rose
8		Graphium	sarpedon	Common Blue Bottle
9			doson	Common Jay
10			eurypylus	Great Jay
11			chiron	Veined Jay
12			agememnon	Tailed Jay
13			evemon	Blue Jay
14			cloanthus	GlassyBlueBottle

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Sr. No	Family	Genus	Species	Common Name
	Nymphalidae			
1		<i>Danaus</i>	<i>chrysippus</i>	Plain Tiger
2			<i>Plexipus</i>	Common Tiger
3			<i>genutia</i>	Stripped Tiger
4		<i>Tirumala</i>	<i>limniace</i>	Blue Tiger
5		<i>Euplea</i>	<i>core</i>	Common Indian Crow
6			<i>Sylvester</i>	double branded crow
7			<i>midamus</i>	blue spotted crow
8		<i>Melanitis</i>	<i>phedima</i>	Dark evening brown
9			<i>leda</i>	Evening brown
10		<i>Junonia</i>	<i>lemonias</i>	Lemon Pancy
11			<i>iphita</i>	Chocolate Pancy
12			<i>atlites</i>	Grey Pancy
13			<i>orithya</i>	Blue Pancy
14		<i>Callerebia</i>	<i>nirmala</i>	Common argus
15		<i>Argynnis</i>	<i>Children</i>	Large Silver stripe
16			<i>hiperbis</i>	Indian fritillary
17		<i>Perseus</i>	<i>Mycalesis</i>	Common bush brown
18			<i>Mineus</i>	Dark branded bush brown
19		<i>Elymnias</i>	<i>hypermnestra</i>	Common palm fly
20		<i>Acraea</i>	<i>Viola</i>	Tawny costor
21			<i>Terpsicore</i>	
22		<i>Discophora</i>	<i>Lepida</i>	Southern duffer
23		<i>Symbrenthia</i>	<i>Lilaea</i>	Common jester
24		<i>Hiplimnas</i>	<i>Bolina</i>	Egg fly
25		<i>Phalenta</i>	<i>phalenta</i>	Indian leporid

Table 3
Species diversity of family Lycaenidae

Sr. No	Family	Genus	Species	Common Name
1	Lycaenidae	<i>Leptotes</i>	<i>plinius</i>	Zebra blue
2		<i>Spindasis</i>	<i>vulcanus</i>	C. Silver line
3		<i>Azanus</i>	<i>uladus</i>	Bright babul blue
4		<i>Zizeeria</i>	<i>karsendra</i>	Dark Grass Blue
5		<i>Zizina</i>	<i>Otis</i>	Lesser grass blue
6		<i>Chilades</i>	<i>pandvas</i>	Plain Cupid
7			<i>trochylus</i>	Grass Jewel
8		<i>hypolimnus</i>	<i>bolina</i>	Great Egg Fly
9		<i>Aphnaeus</i>	<i>schistacea</i>	Silver Line

10		<i>Cupido</i>	<i>minimu</i>	Little Blue
11		<i>Curetis</i>	<i>Acuta</i>	Angled sunbeam
12		<i>Pseudo Zizeeria</i>	<i>maha</i>	Pale grass blue
13		<i>Zizula</i>	<i>Hylax</i>	Tiny grass jewel
14		<i>Eucrysops</i>	<i>cnejus</i>	Gram Blue

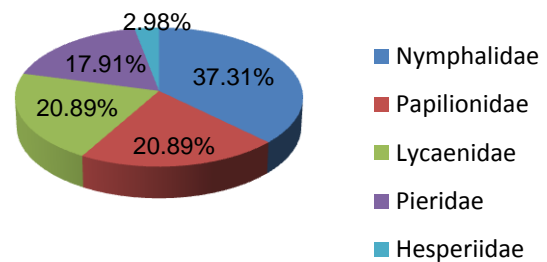
Table 4
Species diversity of family Pieridae

Sr. No.	Family	Genus	Species	Common Name
	Pieridae			
1		<i>Pareronia</i>	<i>aleria</i>	The common wanderer
2		<i>Catopsilia</i>	<i>florella</i>	African emigrant
3			<i>pomona</i>	Lemon Emigrant
4			<i>pyranthe</i>	Mottled Emigrant,
5		<i>Eurema</i>	<i>brigitta</i>	Small Grass Yellow
6			<i>andersonii</i>	One-spot Grass Yellow
7			<i>lateta</i>	Spotless Grass Yellow
8			<i>hecabe</i>	Grass yellow
9			<i>Blanda</i>	Three-Spot Grass Yellow
10			<i>lacteol</i>	scarce Grass Yellow
11		<i>Colias</i>	<i>croceus</i>	clouded yellows
12		<i>Gandaca</i>	<i>harina</i>	Tree Yellow

Table 5
Species diversity of family Hesperidae

Sr. No.	Family	Genus	Species	Common Name
	Hesperidae			
1		<i>Telicota</i>	<i>colon</i>	Pale palm dart

Percentage of species



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