



DIVERSITY STATUS OF RHOPALOCERA IN AND AROUND NAGPUR REGION: A REVIEW

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ABSTRACT:

Butterflies plays important role in ecosystem and their diversity is considered as a good indicator of healthy biotope. Now a day's due to anthropocentric developmental activities and climate change, diversity of butterflies and their micro-habitat pose great threats in and around Nagpur region. Nagpur is situated at centre of the India. It is well known for having and maintaining good green cover. Many researchers reported the data of butterfly species and available very randomly. In past D'Abreu (1931) recorded 91 species in central provinces of Nagpur. After, Pandharipande (1990) recorded 61 species of butterflies in different regions of Nagpur. Recently Ashish Tiple reported total 167 species belongs to 90 Genera of butterflies in Vidarbha region. Out of that Nagpur is the residence of 145 butterfly species. This observation indicates the diversity and abundance of butterflies in Nagpur region increased in last two decades. Recently in 2021 a team of nature enthusiasts reported a new butterfly species sighted for the first time in Nagpur and named 'Psyche' (Common name in Marathi 'Manmauji'). The objective of this paper is to review the available literature and delineate the available Rhopalocerid diversity in a sequential manner. So that, a baseline datasheet will be available for prospective researcher and others too.

Keywords: - Diversity, Butterfly, Urbanization, Baseline status.

INTRODUCTION :

Butterflies are the most beautiful and important creature found everywhere around the world except near the poles. These are precious components of ecosystem and food chain of birds, Reptiles, Amphibians, Spiders and Predatory insects (Aneesh *et al.*, 2013). Butterflies are the best rapid indicators of habitat quality being sensitive indicators of the climatic change (Venkataramana, 2010). In India there are 1504 species of butterflies were reported (Smetacek, 1992; Gaonkar, 1996). Butterflies are sensitive biota which get severely affected by environmental variations and changes in forest structure (Pollard, 1991). Butterflies serves the ecosystem especially by recycling nutrients (N, P & K) essential for crop (Schmidt and Roland, 2006). Their larvae release

faeces while feeding on the agrestals and provide required nutrients to the crops (Marchiori and Romanowoski, 2006). According to Kunte, (1997) butterflies and their caterpillars are dependent on specific host plants for food, in this way diversity of butterflies indirectly reflects especially that of shrubs and herbs in the study area (Padhye *et al.*, 2006). Butterflies are belongs to 'Flagship Taxa' in biodiversity inventories (New *et al.*, 1995; Lawton *et al.*, 1998). Butterflies are the most studied group among all the insects described by Larsen (1997 a; b; c;). Many scientists have worked on butterflies in the India. Pioneers of them were Bentham J.A. (1891), Chandrakar M.; S. Palekar (2007), D'Abreu (1931), Evans (1932), Gaikwad A.R., S.S. Shende and K.S. Kamble (2015), Kharat A.; Nikam and Bhandare (2018), Kunte

K.(1997),A.D. Tiple, Kasambe R., J.Wadatkar. Nagpur city (21° 06' N and 79° 03' E) is located at centre of India. This city is known as for maintaining greenery throughout, although most of the areas are civilized and developed. There are many gardens like 4-5 major gardens, 10-15 small gardens, 2-3 national institutes and University campus with lots of dense vegetation areas which can good resources of butterflies in the city.

BASELINE STATUS OF BUTTERFLY IN NAGPUR REGION :

In 1931, D'Abreu discovered and reported 177 species of butterflies within previous central provinces of Nagpur region. If we understand the history of region there are four divisions of previous central provinces, there are **Nerbudda, Jabulpure, Nagpur and Chattisgarh** which were further divided into 18 districts which includes Nagpur district. Out of 177 species,D'Abreu reported 92 butterfly species from Nagpur city. Then Pandharipande (1990) recorded 61 species of butterflies in different regions of Nagpur.

In 2007, A. D. Tiple and A. M. Khurad conducted a record of butterfly diversity in reserve forest are of Seminary Hill region of Nagpur city and reported 98 species of butterflies belonging to Papilionidae (6 species), Pieridae (14 species), Nymphalidae (39 species), Lycaenidae (24 species) and Herpitiidae (15 species) were recorded. Raju Kasambe and Jayant Wadatkar given checklist of butterfly fauna in and around Nagpur city. They reported 86 species, 14 species were missing which are reported by D'Abreu in past. A. D. Tiple and Khurad (2009) compiled total 145 species from different eight study sites of Nagpur belonging Nymphalidae (51 species) with 17 new records, Lycaenidae (46 species) with 29 new records, Herpitiidae (22 species) with 14 new records, Pieridae (17 species) with 4 new records and Papilionidae (9 species). Among those 145

butterfly species, 24 species come under protection category as per Indian Wild Life Protection Act (1972).Description is in table No.1.

K. G. Patil *et.al* (2014) were reported 92 species of 59 genera from Gorewada International Bio Park, Nagpur, Central India. P. U. Gajbe (2016) recorded 53 species of butterflies belonging 53 genera of 5 families in Umred – Karhandla Wildlife Sanctuary, Maharashtra of Nagpur district. Among five families Papilionidae is represented by 7 species, Hesperidae by 3 species, Lycaedae by 10 species, Nymphalidae by 23 species and Pieridae by 10 species of butterflies. Barragade DD *et. al* (2019) were recorded diversity of total 30 species of butterflies belongs to 20 genera and 5 families in and around RamtekGadmandir forest area, Central India. Among all the researches of butterfly in Nagpur region Nymphalidae family is abundant. Nymphalidae was richest in terms of abundance as well as species richness next to Lycaenidae, even though it was also the dominant family at the natural and artificial forest habitats. The dominance of Nymphalidae can be due to the polyphagous habit that helped them to live in all habitats (Sreekumar and Balakrishnan, 2001b), which comprised the largest family of butterflies. The Pieridae were reported in good abundance and richness. Pieridae are sun lovers seen basking in sun with wings partially open (Kehimkar, 2008). Family Lycaenidae known to adapt various climates and feeding on a variety of larval foodplants (Kunte, 2001). Papilionidae were also reported as dominant because they prefer to tall trees providing moderate sunlight (Mathews and Anto, 2007). Papilionidae dominance was relatively high in the artificial and natural forests rather than in the grassland habitat.

RELATIONSHIP OF HABITAT :

Butterflies are Phytophagous, So the co-relation between butterflies and different floristic

characters of the nectar host plants is showing in a biotope (Tiple *et.al* 2006). Seminary hill, Gorewada International Bio Park, RamtekGadmandir and Umred-Karhandla wildlife sanctuary, Ambazari Garden are great hot spot of butterflies in Nagpur. Different regions of Nagpur are mostly civilized and developed maintaining greenery surrounded with major gardens. Small gardens, national institute, agricultural field and also water resources. These all green zone regions provide wide range of Habitat for butterflies in and around Nagpur city. The Central Nagpur regions developing day by day by roads, highway, rail lines, over bridges and metro. So that the Habitat of butterflies badly influenced. But if we see around Central Nagpur i.e. Peripheral regions maintaining green zone which provides food and shelter to the butterflies which are the best sites for butterfly study and providing Habitat to them.

There is specific relationship between butterfly and host plants or habitat. So it is necessary to know the exact needs of the immature stage to make conservation of butterfly successful. (New *et.al* 1995)

SEASONAL VARIATION :

Seasonal Variation and diversity of butterflies were generally higher from June to December months than February to March months, as mentioned in many researchers. Nagpur district has tropical dry climate contains three main seasons. These three seasons are dry winter, wet monsoon and hot dry summer and temperature varies from 12^o-25^o (min) to 30^o-45^o(max). In this season combination of seasonal variation of butterfly diversity changed. The abundance of butterfly families was reported usually highest during autumn season. This is may be related to an increase in young vegetation, flowering of plants and the appropriate climatic conditions. Optimum light, temperature and rainfall usually increase the

vegetation and thereby directly favour their abundance. Hence, there is a direct correlation between abundance of butterflies with flowering of plants, intensity of light and larval host plant (Kitahara *et al.*, 2000; Kunte, 2000; Hussain *et al.*, 2011).

During winter season the declined of species diversity and abundance can be associated with habitat dryness and differences in microhabitat conditions in various seasons. However, butterfly count shows gradual decrease in numbers from December onwards with the onset of dry condition. This dry period was least favorable to many butterflies, probably due to the scarcity of water, nectar and fresh foliage. In addition, the diversity and species richness indices were also high during spring and lowest during summer. There were population peaks and troughs, because butterflies try to time the emergence of their larvae with their food plants having fresh young leaves. Therefore, this variation of butterfly diversity in different seasons indicates that, the abiotic factors such as rainfall, temperature and humidity played a vital role in influencing the distribution and abundance of butterflies (Shubhalakshmi and Chaturvedi, 1999; Hill *et al.*, 2003).

RELATIONSHIP WITH ENVIRONMENTAL FACTORS :

In Nagpur district temperature of the city ranges from minimum 12^o to 25^o & maximum 30^o to 45^o including humidity ranges from 10^o- 15^o to 60% - 95%. Every year precipitation occurs upto 1138.5 mm, between months from June to September 90% of rain occurs. Because peripheral regions of the Nagpur district mostly covered with green zone and wide habitat range. Diversity population of butterflies has strong relation with environmental factors like temperature, rain and humidity (Hill *et al.*, 2003). In high temperature & rainy season diversity decreases. Butterfly diversity can occur

near lakes, streams, rivers & ponds in humid regions.

IUCN STATUS OF BUTTERFLY :

According to Xercessociety for invertebrate endangered speciesconservation, support given to promote butterfly conservation on forms in parks,wildland. Butterflies need such areas which is free from insecticides. Europe repealed that grassland butterfly speciesdecreased 50 percent since early 1990. Three quarter of speciesof butterflies in UK are decline and five species have gone extinct since 1950. According to International Union for Conservation of Nature (IUCN) reclassified the migratory Monarch butterfly asendangered on its Red list.This species is endangered from allover world. In India IUCN red list contains 1,47,517 of which 41,459 are threatened with extinction.

CONCLUSION :

Butterflies play a vital role in maintaining the ecosystem as pollinator,prey, biological pest control, induce genetic variation in plants and enhance environmental beauty, reduce the level of carbondioxide in air. But butterfly population is declining gradually due to anthropocentric developmental activities the habitat zone of butterflies is shrinking. Change in seasonal variations also impact to the diversity of butterflies. Therefore, an appropriate management plan should be framed and stringently implement.

RECOMMENDATIONS :

Never capture a butterfly. Encourage people to leavebutterflies to fly free. We must admire their beauty. We shouldaware, the other peoples about the importance of butterfliesand other insects. A great way to help these insects survive, is to eat organicfoods, avoid the use of herbicides, landscaping and cultivatemilkweed and other nectar plants in garden. These insects needour help and we need their invaluable contributions to saveour entire ecosystems.

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Table No. 1

S.N.	Common Name	Scientific Name	Status
1	One-Spot Grass Yellow	<i>Eurema andersonii</i>	NR
2	Common Gull	<i>Cepora nerissa</i>	VC
3	Eastern Stripped Albatross	<i>Appias libythea</i>	NR
4	Common Albatross	<i>Appias albina</i>	VR
5	Common Wanderer	<i>Pareronia valeria</i>	VC
6	Great Evening Brown	<i>Melanitis zitenius</i>	R
7	Bamboo Treebrown	<i>Lethe Europa</i>	C
8	Whiteline Bushbrown	<i>Mycalasis malsara</i>	R
9	Yellow Rajah	<i>Charaxes masmax</i>	VR
10	Short Banded Sailes	<i>Neptis columella</i>	R
11	Chestnut-Streaked Sailes	<i>Neptis jambah</i>	R
12	Danaid Eggfly	<i>Hypolimnas misipus</i>	VC
13	Common India Crow	<i>Euploea core</i>	VC
14	Brown King Cro	<i>Euploea klungii</i>	NR
15	Common Pierrot	<i>Castalius rosimon</i>	VC
16	Dark Pierrot	<i>Tarucus ananda</i>	R
17	Common Hedge Blue	<i>Actolepis purpa</i>	C
18	Eastern Grass Jewel	<i>Chilades putti</i>	C
19	Gram Blue	<i>Euchrysops cnejus</i>	VC
20	Pea Blue	<i>Lampides boeticus</i>	VC
21	Common Cerulean	<i>Jamides celena</i>	VC
22	Scarce Shot Silverline	<i>Spindasis elima</i>	R
23	Leaf Blue	<i>Amblypodia anita</i>	VR
24	Paintbrush Swift	<i>Baoris farri</i>	VC

VC – Very Common
VR – Very Rare

NR- Not Rare
C - Common

R – Rare