Eco. Env. & Cons. 30 (January Suppl. Issue) : 2024; pp. (S12-S15)
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ISSN 0971–765X

DOI No.: http://doi.org/10.53550/EEC.2024.v30i01s.002

To Study Diversity and Distribution of Butterflies in Jawhar Tehsil, Palghar, Maharashtra, India

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(Received 17 June, 2023; Accepted 12 August, 2023)

ABSTRACT

This study was conducted in Jawhar taluka of Palghar district which lies in line of Western Ghats from February 2022- March 2022. In Jawhar, Shivajinagar, Jay Sagar Dam, Khadkhad Dam, Kalmandavi were the sites for study. Study reveals that total 23 species were found which belong to 5 families. Nymphalidae comprise of 12 species of butterfly and is richest family with 52% composition, Papilionidae with 4 species (17%), Pieridae 2 species (9%), Lycaenidae 3 species (13%) and Riodinidae 2 species (9%). It also shows that the highest species richness was recorded in Shivajinagar 10 species (44%), Jay Sagar Dam 7 species (30%), Khadkhad Dam 5 species (22%), Kalmandavi 1 species (4%).

Key words: *Butterflies, Diversity, Palghar*

Introduction

The kingdom animalia is represented by 1,552,319 species that been described so far, globally in 40 phyla in a new evolutionary classification. The phylum Arthropoda includes 1,242,040 species, constituting about 80% of the total number of species. The most successful group insect, accounts for about 66% (1,020,007) species in 39 orders, of all animals (Zhang, 2011).

Butterflies are one of the most taxonomical studied group of insects (Modak *et al*., 2018). They are also very popular among nature lover for their fascinating things beauty and attractive colours. Butterflies are known to be good pollinators and very sensible to environment factors such as; temperature, humidity, rainfall, solar radiation, air temperature and significantly available of larval host plants (Gohel and Raval, 2019).

They are one of the most beautiful and striking species of insect on the earth and they are playing a very crucial role in the ecosystem as well as human health. the butterflies are the best indicator of these changes and can be used as surrogate to access the conservation threat to the biodiversity. Many of butterfly species are strictly seasonal and prefer only a particular set of habitats and they are good indicator in terms of anthropogenic disturbance and habitats quality (Patil *et al.,* 2019).

India harboured total 1504 of butterflies' species which accounted 8.75% of the world's butterfly and 285 species found in southern Indian, the peninsular India and Western Ghats have 357 and 334 species respectively (Abdullahi *et al.,* 2019; Tiple, 2012). Northern Western Ghats is a hot spot of biodiversity where total 191 species of butterflies belonging to 117 genera and 06 families recorded (Padhey *et al.,* 2013).

In India 34 hot spots found in Western Ghats. The region supports a rich butterfly fauna because of its average annual rainfall that often exceeds 2,000 mm, which is ideal for most flora and fauna. Butterflies

are well studied according to their taxonomical aspect with respect to continuous addition of new species of butterflies. The species richness and relative abundance of individuals are the noteworthy factors which develop the conservation status and enhance the biodiversity thus beneficial to the ecosystem. The preference of butterflies for particular habits is connected with availability of host plant by acting as a carrier of the pollen from the flower and hence helping in development of new plants (Dabhadkar and Prajapati, 2020).

Butterflies are studies to monitor the change in climate and are very sensitive to temperature, humidity, habitat disturbance and the light levels. Butterflies like other birds and animals are studied as ecological indicators and assume a critical role in both ecological and economic benefits for the human beings. They are one of the importance food chain components for the birds and other predatory animals and they also help in pollination when they move from one plant to another while collecting nectar. They are key components in maintaining ecological dynamics of the protected areas and protected areas are major support system for maintaining their diversities. Distribution and variation in butterfly diversity changes in heterogeneous habitats with different ecological parameter (Suryanarayana *et al.,* 2018).

Most butterflies are seasonal and prefer a specific type of habitat. The main objective of this study was to gain knowledge about the diversity of butterflies in the tropical region of Jawhar taluka and the diversity according to the seasons. The present study compiled a list of butterflies in selected areas of Jawhar Taluka in Palghar District to find out the current status of butterflies in and around Jawhar Town and to cultivate butterfly species in the area.

Materials and Method

Area of study

The present study was carried out in Jawhar taluka in Palghar district in the state of Maharashtra in kokan division. The study area is situated latitude 19.92°N and longitude 73.23°E. It has average elevation of 447 m (1,467 ft). The study area distance of Jawhar from Palghar is 75km Situated in the ranges of the Ghats. The temperature varies from 14-40! (50°f-95°f). A climate of the Jawhar is dry and average rainfall 2500 and 3500 mm and humidity is 50-90%.

Sampling Site

The sampling site were selected in the study area, which include: Shivajingar, Kalmandavi, Jaysagar dam, Khadkhad dam.

- First select place Shivajinagar is located between 19°57′15" N and 73°12′58" E. Total geographical area of place is 7.875 ha(19.46 ac).
- Second select place Jaysagar Dam is located between 19°45′11.29" N and 73°13′21.12" E. Total geographical area of this place 9.31 ac(3.767 ha).
- Third select place Khadkhad Dam located between19°45′13.70" N and 77°15′22.13" E. Total geographical area this place 56.03ac (22.675 ha).
- Forth select place kalmandavi located between 19°55′23.81" N and 73°13′44.8" E. Total geographical area this place 65.76 ac (26.6127 ha).

Sampling Method

There was random sampling used and observation in the sampling site for a period 1 year between Feb 2021 to Feb 2022. Butterflies were accessed in the study area from 8 am to 6 pm in the morning by random observations during walking through the four selected sites based on habitats present in the study area and note maximum species of butterflies (Abdullahi *et al*., 2019). Survey was done once to twice times a week. Butterflies was collected from grass land, plants, water resources, dam, flowering plant and field etc. Collection was made by the sweep net method. Collected butterflies were etherized in placed in paper envelops (Bharmal *et al.,* 2011). The observed butterfly photographed in super quality camera Cannon EOS 1500 D DSLR with GPS device in live condition. Then Monographs, Research Article, Research Paper and The book of Indian butterflies by Isaac kehimkar was used for the identification and classified of butterfly.

Identification species of butterfly

The photographs of butterflies were used for the identification of the species of butterfly. Colour patterns, sizes and shapes as well as their designs were considered in identification of the species of butterfly with the help of entomologist expert and guiding book (Abdullahi *et al*., 2019) and handbook of Indian butterfly (Wynter – Blyth, 1957) and the book of Indian butterflies by Isaac kehimkar.

Results and Discussion

The checklist of the species of butterfly observed in the study area is presented in Table 1. The result showed that a total 23 species belong to 5 families were recorded in the study area. Nymphalidae was the richest family in the study area that comprised 12 species of butterfly followed by Papilionidae with 4 species, Pieridae 2 species, Lycaenidae 3 species and Riodinidae 2 species families were the lowest with each as indicated in the Table 1.

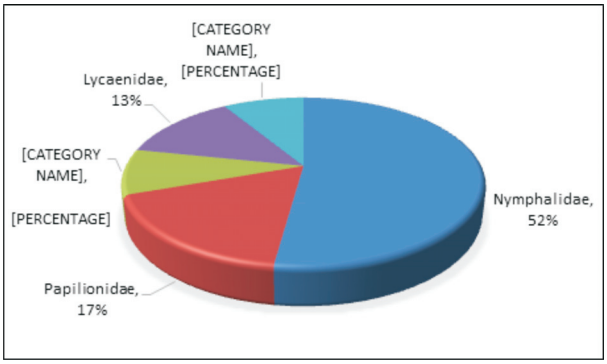

Fig. 1. Family wise percentage composition of the species of butterfly in the study area Jawhar taluka, Palghar

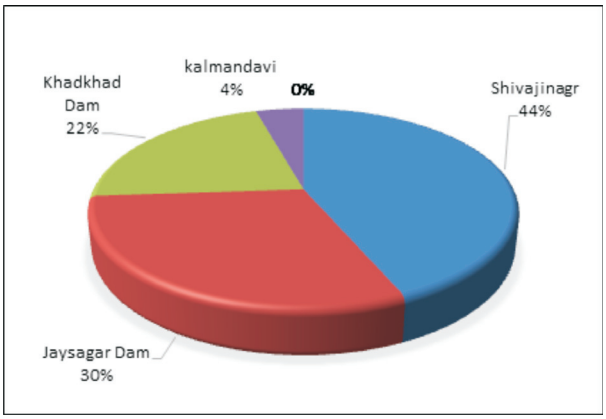

Fig. 2. Comparison of butterfly species recorded from different sites of Jawhar, Maharashtra.

Conclusion and Recommendation

There are 23 species of butterfly that consist of 5 families in order Lepidoptera recorded in Jawhar taluka, Palghar District, India during the study period. Based on the results obtained from the study on butterfly diversity in the study area,

Table 1. Checklist of the species of butterfly recorded in the Study area arranged according to family of order lepidoptera

Sr. No.	Family	Common Name	Scientific Name	Species
1.	Nymphalidae	Common castor	*Ariadne merione*	*merione*
2.		Tawny coster	*Acraea terpsicore*	*terpsicore*
3.		Common tiger	*Danaus genutia*	*genutia*
4.		Plain tiger	*Danaus chrysippus*	*chrysippus*
5.		Boronet	*Euthalia nais*	*nais*
6.		Common baron	*Euthalia aconthea*	*aconthea*
7.		Common crow	*Euploea core*	*core*
8.		Common egg fly	*Hypolimnas bolina*	*bolina (jacintha)*
9.		Chocolate soldier	*Junonia iphita*	*iphita*
10.		Common evening brown	*Melanitis leda*	*leda*
11.		Common sailor	*Neptis hylas*	*hylas*
12.		Common four ring	*Ypthima huebneri*	*huebneri*
13.	Papilionidae	Tailed green judy	*Graphium agamemnon*	*agamemnon*
14.		Lime butterfly	*Papilo demoleus*	*demoleus*
15.		Blue mormon	*Papilo polymnestor*	*polymnestor*
16.		Indian common mormon	*Papilo polytes*	*polytes (romulus)*
17.	Pieridae	Common gull	*Cepora nerissa*	*nerissa*
18.		Red line small glass yellow	*Eurema brigitta*	*brigitta (rubella)*
19.	Lycaenidae	Common pierrot	*Castalius rosimon*	*rosimon*
20.		Indian cupid	*Cupido lacturnus*	*lacturnus*
21.		Dark grass blue	*Zizeera Karsandra*	*Karsandra*
22.	Riodinidae	Lankan plum judy	*Abisara echerius*	*echerius (pranosa)*
23.		Suffed double banded judy	*Abisara bifasciata*	*bifasciata (suffosa)*

Nymphalidae family was found maximum in number and percentage of the species of butterfly among all the families. Also, Shivajinagar was found highest among the other sites in terms of individual number of butterflies.

Butterflies maintain the ecosystem by acting as pollinator, prey, biological pest control, make genetic variation in plants, and increase environmental beauty, decrease the level of carbon dioxide in air. Butterflies play an important role during ripening stage of paddy crop for better pollination and other crop also for harvest quantity and quantity crop, therefore it need to conserve food plant of butterfly larvae in target area. This study will also add to our future attempts in understanding the complex nature of mutualistic contact between butterflies and flowering plants that is important for continuity of ecosystem services.

Acknowledgements

We are thankful to Dr. Harshad Vanmali H.O.D. of Zoology Department and Dr. Kiran Save Principal and Management of S.D.S.M. college, Palghar, for motivation and help during this study.

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