

Diversity and Ethological Study of Butterfly Species Found in Sree Chaitanya College Campus, North 24 Parganas, West Bengal

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ABSTRACT

Butterflies are an extremely important group of colorful insects belonging to Phylum – Arthropoda, under Class- Insecta and order- Lepidoptera. They are highly sensitive to environmental change and sometimes considered bio-indicators of climate and are potential pollinators. This work was aimed at studying the diversity and common behavioral aspects of butterflies. The study was conducted in Habra and around Sree Chaitanya College from February to September 2022. A total of 35 different species under 25 genera belonging to five families were reported. The maximum number of species belonged to the family Nymphalidae. The ethological aspects of some butterflies were studied in detail. Six butterfly species belonging to three families were studied. The butterfly species studied were the tawny coster, plain tiger, common jezebel, common palm fly, common silverline. A specific behavioural pattern like hovering, basking, resting, flight and nectarine was documented. Observation revealed that plain tiger, tawny coster, common silverline spent most of the time resting. The preference of the butterfly species for nectar-collecting plants was also studied. It was observed that, despite having a number of flowering and non-flowering plants in the area, each butterfly species has a specific preference for their nectar plants.

Keywords: *Butterfly; Diversity; Sree Chaitanya College; Ethology*

Introduction

Butterflies are one of the best taxonomically studied groups of insects (Robbins & Opler, 1997) There are more than 28000 species of butterflies worldwide and India having different terrain, climate and vegetation, houses about 1500 species of butterflies (Tiple, 2011). The butterflies have been regarded as indicators of the health and quality of their host plant and the ecosystem as a whole. The habitat ecology of butterfly species is governed by nectar as well as host plant preference. A report suggests that the butterfly species increase as per the availability of plant species in semi-urban and urban areas (Kuussaari *et al.*, 2007). Butterflies show a preference for nectar flowers and do not feed indiscriminately on any flowers available (Tiple, Deshmukh & Dennis, 2005). However, very little information is available regarding the feeding habits of adult butterflies (Kunte, 2000).

With developmental activity and anthropogenic reasons greenery is lost. In addition, the increase in pollution of the air, water and soil, poses threats to wildlife. This ultimately results in an ecological imbalance. Even in such a situation, the institutional campuses with relatively undisturbed natural vegetation are providing a potential habitat for insects, including the butterfly population (Nair, Mitra & Bandyopadhyay, 2014).

Sree Chaitanya College, Habra is located in a sub-urban area in the North 24 district of West Bengal. The campus is spread over a large area with natural green vegetation as well as a managed garden, providing a good habitat for the butterflies. As the campus has a good source of nectar and plants preferred by butterflies for completing their life cycle, along with no use of pesticides, different types of the butterfly are found in this area.

This study was aimed at preparing a checklist of butterflies found on the campus of Sree Chaitanya College, Habra as there is no published checklist of butterflies of the area. The present study was also aimed to document the behavioural attributes of some selected butterfly found in this area.

Materials and methods

Study Site

Sree Chaitanya College campus in Habra, North 24 Parganas, West Bengal, India was selected as the study site. The campus has buildings along with a large ground in the front, a managed garden area, a number of open areas with wild vegetation and a medicinal plant garden. The campus has good vegetation with different herbs, shrubs and trees. The present study was conducted on the campus of the college,

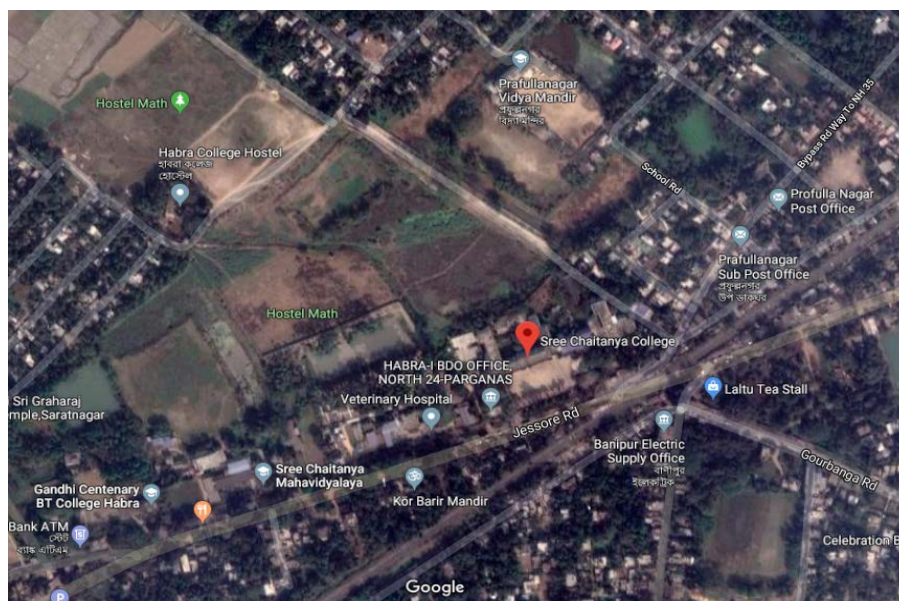


Figure1: Study Site. Red Pin Indicates Sree Chaitanya College

Study Period

The study was conducted from February to September 2022.

Field Survey for Eco-Ethology

The butterfly diversity was determined by an extensive field survey. VES or visual encounter survey technique was used as described earlier (Sanphui, Kabir & Saha, 2021). Briefly, the method involves walking through the study sites systematically searching for butterflies. The butterflies were identified by taking pictures and matching them with the published literature and books. Photographs were taken using the camera.

The different behavioural activities of the butterflies were studied using the focal animal sampling method. A time budget of different behaviours like resting, flying, basking and nectaring was recorded and represented graphically.

RESULTS

Butterfly Diversity in the Study Area

The names of the observed butterfly species is listed in Table 1. 34 species of butterflies in 25 genera and 5 families were reported. The five families were Nymphalidae, Pieridae, Papilionidae, Lycaenidae, Hesperidae. Out of all the five families, majority of the species belonged to the Nymphalidae family. Out of 34 species, 17 belonged to the family Nymphalidae. 7 species belonged to the family Pieridae, 4 species belonged to the family Papilionidae and 3 species belonged to the families Lycaenidae and Hesperidae each. *Hypolimnasbolina*, *Hypolimnasmisippus*, *Papiliopolytes*, *Papiliopolytes*, *Graphiumagaphium* were the most rarely sited species in the study area.

Table 1: List of Butterflies Observed

Sr. No.	Family	Name of Butterfly	Scientific Name	Status
1	Nymphalidae	Angle cestor	<i>Ariadne ariadne</i>	Very common
2		Common palmfly	<i>Elymniashypermnestra</i>	Common
3		Tawny coster	<i>Acraea terpsicore</i>	Common
4		Plain tiger	<i>Danaus chrysippus</i>	Common
5		Common evening brown	<i>Melanitisleda</i>	Common
6		Striped tiger	<i>Danaus genutia</i>	Common
7		Peacock pansy	<i>Junoniaalmana</i>	Very common
8		Grey pansy	<i>Junoniaatlites</i>	Common
9		Common crow	<i>Euploea core</i>	Common
10		Common threering	<i>Ypthimaasterope</i>	Common
11		Common four ring	<i>Ypthimabaldus</i>	Common
12		Great eggfly	<i>Hypolimnasbolina</i>	Rear
13		Danaid eggfly	<i>Hypolimnasmisippus</i>	Rear
14		Common bush brown	<i>Mycalesisperseus</i>	Common

15		Commander	<i>Moduzaprocris</i>	rare
16		Castor	<i>Ariadne merione</i>	very common
17		Common baron	<i>Euthaliaaconthea</i>	common
18	Pieridae	Common jezabel	<i>Delias eucharis</i>	Common
19		Bengali albatros	<i>Appiasolferna</i>	Very common
20		Three spot grass yellow	<i>Euremablanda</i>	Common
21		Striped albatros	<i>Appiaslibythea</i>	Very common
22		Common grass yellow	<i>Euremahecabe</i>	Very common
23		Common wanderer	<i>Pareroniavalera</i>	very common
24		Psyche	<i>Leptosianina</i>	very common
25		Papilionidae	Common mormon	<i>Papiliopolytes</i>
26	Lime		<i>Papiliodemolues</i>	Very Rear
27	Common joy		<i>Graphiumdoson</i>	Rear
28	Tailed joy		<i>Graphiumagaphium</i>	Rear
29	Lycaenidae	Common silverline	<i>Cigaritisvulcanus</i>	Common
30		Common pierrot	<i>Castaliusrosimon</i>	Common
31		Pale grass blue	<i>Pseudozizeerimaha</i>	Common
32	Hesperiidae	Indian plam bob	<i>Suastusgremius</i>	Common
33		Small banded swift	<i>Pelopidas mathias</i>	common
34		Rice swift	<i>Borbocinnara</i>	Common

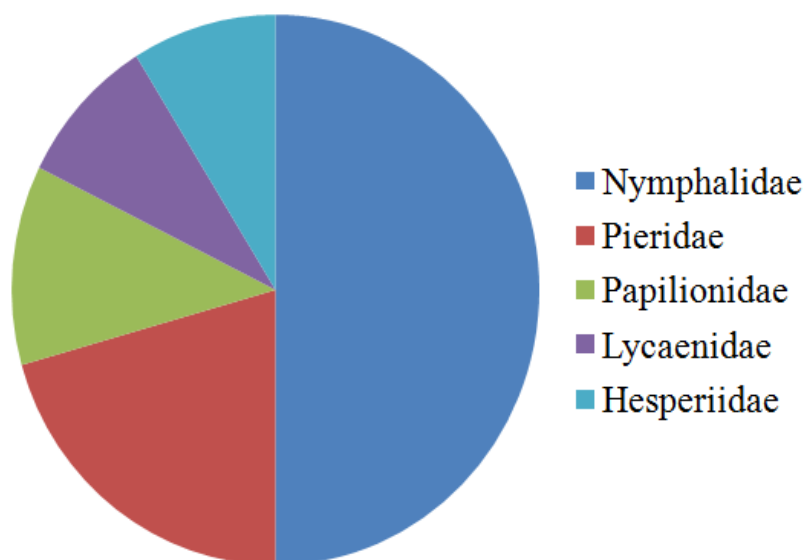


Figure 2: Graphical Representation of Percentage of Different Species of Butterfly Species under Various Families



Figure 3: Some of the Observed Butterflies 1. Pale Grass Blue 2. Common Crow, 3. Striped Albatros, 4. Indian Plam bob, 5. Lime, 6. Common Joy, 7. Common Grass Yellow, 8. Danaid Eggfly 9. Tailed Joy, 10. Great Eggfly, 11. Common Mormon, 12. Bengali Albatros, 13. Common fourring, 14. Common silverline 15. Angel Castor, 16. Common Jezabel, 17. Grey Pansy, 18. Common Plam fly, 19. Tawny Coster, 20. Peacock Pansy, 21. Plain Tiger

Behavioural Activities of Butterfly Species in the Study Garden

The different behavioural activities of some selected butterfly species were studied. Various activities such as flight, resting, nectering and basking were studied for selected species found in the study area. Different species of butterflies were observed during the study period. Many were visitors of short duration who came for nectaring, but did not stay, most probably due to a lack of suitable host plants and other conditions. Seven species that were regularly seen were chosen for behavioral study. The seven species selected were Common jezebel, Grey pansy, Angle castor, Tawny coster, Common palmfly, Plain tiger, Peacock pansy.

It was observed that the common Jezabel spent the maximum time in nectering where as the common palmfly spent most of the time in resting. Common Jezabal and Peacock Pancy spent the least percentage of time in resting. Among all the 7 observed butterfly species Angle castor spent the highest percentage of time in flying, Common Jezabel and Peacock pansy were the highest percentage of time nectering. Common palmfly was the species that spent the highest percentage of time resting.

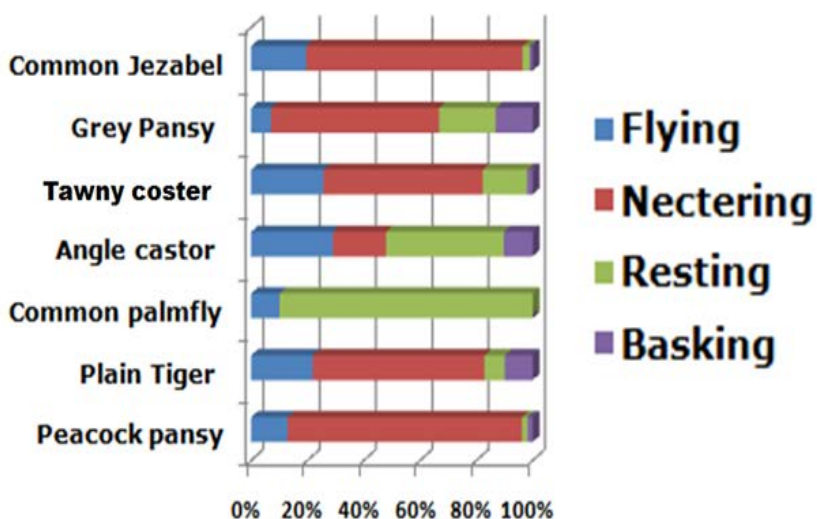


Figure 4: Comprehensive Representation for Several Behaviouralactivities of Different Butterfly Species During the Studyperiod in the Study Area

Discussion

The butterflies are one of the prominent biodiversity markers (Kunte, 2000), major pollinators of both wild and cultivated plants (Tiple, Deshmukh & Dennis, 2005) and also act as naïve gardeners. An abundance of butterflies usually indicates a healthier ecosystem. The preference of butterfly species towards particular habitats is associated with the availability of host plants on which the larva can feed and the adult can collect nectar. There is seasonal variation in the diversity of butterflies. In some months, the number of butterfly species is abundant, however, in other months, they are rare or absent. (Kunte, 2000). It has been shown by Wynter-Blyth (1957) that there are two peak seasons for the abundance of butterfly species in India, one is March–April and another in October.

The present study provides an account of butterfly diversity inside Sree Chaitanya college campus. Observation reveals presence of 34 species of butterfly under 25 genera and 5 families. The highest number of species belonged to family Nymphalidae. The geographical location of any area, its climatic conditions and vegetative composition are essential requisites for supporting a rich diversity of butterflies.

In the study it was seen that in spite of environmental stresses, the butterfly diversity may be high if suitable nectaring as well as host plant is found for a sustainable life. Apart from feeding on nectar, the diet of adult butterfly may vary from rotten fruit to vegetable, mineral from soil etc. Drinking at wet soil patches is an important feeding activity in many butterflies. The butterfly diversity along with different behavioural activity was documented in the present study. Foraging behaviour of selected butterfly was observed on different flowers like *Lantana camara*, *Mikania micrantha*, *Melochiacorchorifolia* etc. The colour and fragrance of flowers employ strong signal for foraging of butterflies (Begum, Habiba & Howlader, 2014 and Goulson & Cory 1993). The butterfly diversity in the study site indicated a varied assemblage of floral species. The flora in the study area was a mixed type with herbs and shrubs dominating the vegetation. The number of trees are comparatively lesser. Although information regarding species specific habitat study and different ethological activities of butterfly is available (Young, 1975) studies on comprehensive eco-ethology of different butterfly species is very less.

Conclusion

The study throws light on nectar as well as host-plant preferences and the behavioural activities of several butterfly species. The study also underline the importance of institutional campuses as a preferred habitat for butterflies. If these campuses are maintained properly the butterfly diversity may increase in the study area providing a rich ground for butterfly conservation and research. Future attempts would be taken in understanding the complex mutualistic interaction between the different butterfly species and the flowering plants. This is the first effort in exploring the butterfly diversity in Sree Chaitanya college campus. The present list of butterfly species is not conclusive and future studies will be conducted to update this list.

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References

Begum, M., Habiba, U., & Howlader, M. A. (2014). Nectar feeding behavior of some butterflies in the botanical garden of Dhaka University. *Bangladesh Journal of Zoology*, 42(1), 85-90. <https://doi.org/10.3329/bjz.v42i1.23339>

- Goulson, D., & Cory, J. S. (1993). Flower constancy and learning in foraging preferences of the green-veined white butterfly *Pleris napi*. *Ecological entomology*, 18(4), 315-320. <https://doi.org/10.1111/j.1365-2311.1993.tb01107.x>
- Kunte, K. (2000). *India, a Lifescape: Butterflies of Peninsular India*. Universities Press.
- Kuussaari, M., Heliölä, J., Luoto, M., & Pöyry, J. (2007). Determinants of local species richness of diurnal Lepidoptera in boreal agricultural landscapes. *Agriculture, Ecosystems & Environment*, 122(3), 366-376. <https://doi.org/10.1016/j.agee.2007.02.008>
- Kuussaari, M., Heliölä, J., Luoto, M., & Pöyry, J. (2007). Determinants of local species richness of diurnal Lepidoptera in boreal agricultural landscapes. *Agriculture, Ecosystems & Environment*, 122(3), 366-376. <https://doi.org/10.1016/j.agee.2007.02.008>
- Nair, A. V., Mitra, P., & Bandyopadhyay, S. A. (2014). Studies on the diversity and abundance of butterfly (Lepidoptera: Rhopalocera) fauna in and around Sarojini Naidu college campus, Kolkata, West Bengal, India. *Journal of Entomology and Zoology Studies*, 2(4), 129-134.
- Robbins, R. K., & Opler, P. A. (1997). Butterfly diversity and a preliminary comparison with bird and mammal diversity. *Biodiversity II: understanding and protecting our biological resources*, 69-82.
- Sanphui, P., Kabir, A., & Saha, G. (2021) Ophiofaunal diversity of Bongaon Subdivision of West Bengal, India, with a note of possible threats to the Snake population of the area. *Journal of Biodiversity and Environmental Sciences (JBES)*, 19(1), 62-69.
- Tiple, A. D. (2011). Butterflies of Vidarbha region, Maharashtra State, central India. *Journal of Threatened Taxa*, 3(1), 1469-1477. <https://doi.org/10.11609/JoTT.o2397.1469-77>
- Young, A. M. (1975). Feeding behavior of Morpho butterflies (Lepidoptera: Nymphalidae: Morphinae) in a seasonal tropical environment. *Revista de Biologia Tropical*, 23(1), 101-123.