Short Communication

A Study on Butterfly Diversity of Tingkhong College Campus, Dibrugarh, Assam, India

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ABSTRACT

Aim: Popularly known as living jewels, butterflies are very delicate, elusive, amiable creatures in the world. They are considered to be one of the good pollution indicators. The present study on butterfly diversity aims to illuminate the richness and diversity of the Tingkhong College campus in the Dibrugarh district of Assam. **Materials and Methods:** A continuous survey was undertaken during three successive months i.e. June, July, August and September of 2023 in early morning (9.00-11.00 am); especially during college hours. **Results:** The present study recorded 33 species belonging to five lepidopteran families. The Nymphalidae family was found to be the most dominant family with 13 number of species, followed by Papilionidae (7 species), Lycaenidae (6 species), Pieridae (4 species) and Hesperiidae with 3 species. **Conclusion:** The results somehow depict the rich biodiversity and the pollution-free campus of the college. Further, it will help to conserve these beautiful creatures in their natural habitat.

Keywords: Delicate, Amiable, Diversity, Pollinator.

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INTRODUCTION

Butterflies, popularly known as the living jewels, are considered as the most delicate and alluring species among the insect group of the order Lepidoptera. They occupy a vital position in the ecosystem as their occurrence and diversity indicate the fitness and purity of that area.[1,2] Butterflies are also act as a bio-indicators as they are verry subtle to any recurrent changes of the environment like temperature, humidity and habitat-destruction etc.[3] Thus, any commotion in their habitat may have an undesirable impact on butterfly assemblages over time.[4] Besides, the unique and visually tempting wing patterns of butterflies have a worthwhile trade market in the world.[5]

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Being a part of the Himalayan and Indo-Burma biodiversity hot spot, Northeast India is considered as one of the pivotal centres of butterfly diversity.[6] According to Singh *et al.*,[7] more than 50% of butterfly species recorded in India occur in the eastern Himalayas and north-eastern region. Moreover, a total of 962 butterfly species have been reported from Assam, representing 5 families.[8]

Situated in a rural area of Dibrugarh district, the campus of Tingkhong College is known for its natural beauty. Besides its rich butterfly diversity, the readily available combs of the social insect honey bees inside the campus, indicate a minimal pollution or healthy environmental condition of the campus. In the current investigation, an effort has been made to study the diversity and status of the butterfly species of the Tingkhong College campus of Dibrugarh, Assam.

MATERIALS AND METHODS

The continuous survey was undertaken during three successive months i.e. June, July, August and September

of 2023 in the early morning (9.00-11.00 am); especially during the college hours. Three permanent transect lines were set up at approximately 800 m in length in different locations of the college campus following the Line transact method of Pollard.[9] The transect walks were conducted during the peak Lepidopteran activity, avoiding the rainy and heavily overcast conditions with a slow but constant pace covering the each transacts within one hour. DSLRs and I-Phone were used for capturing and identifying those butterflies which were unable to identify in the field. For the identification of the encountered species, the identification keys of Morre,[10-15] Evans[16] and a photographic guide of Kehimker[17] has been used. The ecological status of butterflies was given as per Kehimker[17]. The IUCN status [Not evaluated (NE), Data Deficient (DD), Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Endangered (EN) and Critically Endangered (CR)] has been assigned to the recorded species following IUCN Red Data Book.[18]

About the study area

Tingkhong College is a Government College of Assam affiliated to Dibrugarh University, Dibrugarh, Assam. It is located in a rural area of Dibrugarh district of Assam (27°13´5´´ N and 95°10´44´´E) (Figure 1) almost 50 km away from Dibrugarh town.

RESULTS

During the present investigation, a total number of 33 species representing five families have been encountered. The encountered species with their IUCN status and the ecological status have been presented in Table 1**.** Among the recorded species Nymphalidae family was found as the dominant family with 13 number of species, which was followed by Papilionidae (7 species), Lycaenidae (6 species), Pieridae (4 species) and Hasperiidae (3 species) respectively (Figure 2).

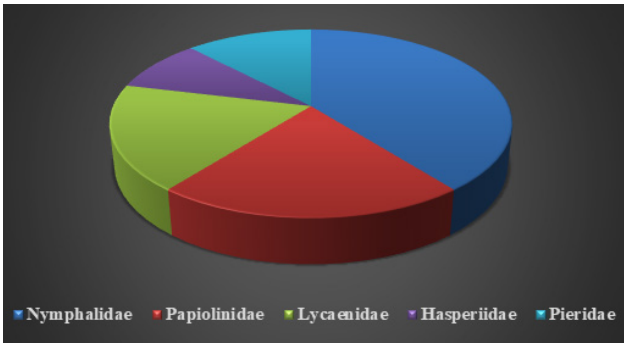

Figure 2: Familywise distribution of the recorded species.

Most of the species recorded during the present investigation have the IUCN status of Not-Evaluated (NE). However, *Junonia hierta* (Fabricius) from Nymphalidae family and *Cheritra freja* (Febricius) of Lycaenidae have the LC status according to IUCN red data book.[18] Moreover, the ecological status of most of the butterfly species recorded was found to be common.[17] However, *Graphium antiphates* (Cramer) from Papilionidae family was found to be 'Common in North India, rare in South India'. Among the 33 species 3 species viz. *Mycalesis gotama charaka* (Moore); *Lexias dirtea khasiana* (Swinhoe); *Lexias pardelis* (Moore) (Figure 3(f)) were found with the ecological status of 'rare' category according to Kehimker.[17]

DISCUSSION

Nymphalidae family was recorded as the most dominant family in the present study with the highest number of species observed during the study period, which is somehow similar with the findings of Bawri *et al.*,[19] Chakraborty *et al.,*[20] Lodh and Agarwala[21] and Saikia

Figure 1: Map of the study area extracted through Google-earth.

Table 1: Checklist of butterfly species encountered with their IUCN status.

Sl. No.	Family	Common Name	Scientific Name	Status as per Kehimkar (2008)	IUCN Status
1	Hesperiidae	Restricted Demon	*Notocrypta curvifascia* (C. and R. Felder)	Common	NE
2		Chocolate Demon	*Ancistroides nigrita* (Moore)	Common	NE
3		Tiger Hopper	*Ampittia subvittatus* (Moore)	Not rare	NE
4	Papilionidae	Common Jay	*Graphium doson* (C. and R. Felder)	Locally Common	NE
5		Great Mormon	*Papilio memnon* (Linnaeus)	Locally Common	NE
6		Common Mormon	*Papilio polytes* (Linnaeus)	Very Common	NE
7		Common Bluebottle	*Graphium sarpedon* (Linnaeus)	Common	NE
8		Yellow Helen	*Pepilio nephelus* (Boiduval)	Not Rare	NE
9		Red Helen	*Papilio helenus* (Linnaeus)	Common	NE
10		Five Bar Sword Tail	*Graphium antiphates* (Cramer)	Common in North India, rare in South India.	NE
11	Pieridae	Three Spotted Grass yellow	*Eurema blanda* (Boisduval)	Common	NE
12		Great Orange Tip	*Hebomoia glaucippe* (Linnaeus)	Common	NE
13		Chocolate Albatross	*Appias lyncida* (Cramer)	Locally Common in South India, Common in North of India.	NE
14		Common Grass Yellow	*Eurema hecabe* (Linnaeus)	Common	NE
15	Lycaenidae	Common Line Blue	*Prosotas nora* (C. Felder)	Common	NE
16		Elbowed Pierrot	*Pycnophallium elna* (Hewitson)	Locally Common	NE
17		Metallic Cerulean	*Jamides alecto* (C. and R. Felder)	Locally Common	NE
18		Transparent Six Line Blue	*Nacaduba kurava* (Moore)	Not Rare	NE
19		Common Imperial	*Cheritra freja* (Febricius)	Locally Common	LC
20		Punchinello	*Zemeros flegyas* (Cramer)	Common	NE
21	Nymphalidae	Common Four Ring	*Ypthima huebneri* (Kirby)	Common	NE
22		Common Five Ring	*Ypthima baldus* (Fabricius)	Common	NE
23		Orange Okleaf	*Kallima inachus* (Boisduval)	Not Rare	NE
24		Nigger	*Orsotriaena medus* (Fabricius)	Locally Common	NE
25		Yellow Pansy	*Junonia hierta* (Fabricius)	Common	LC
26		Chocolate Pansy	*Junonia iphita* (Cramer)	Common	NE
27		Common Bush Brown	*Mycalesis perseus* (Fabricius)	Common	NE
28		Chinese Bush Brown	*Mycalesis gotama charaka* (Moore)	Rare	NE
29		Blue Tiger	*Tirumala limniace* (Cramer)	Common	NE
30		Great Eggfly Female	*Hypolimnas bolina* (Linnaeus)	Common	NE
31		Grey Count	*Tanaecia lepidea* (Butler)	Rarer in South India than North India	NE
32		Dark Archduke Male	*Lexias dirtea khasiana* (Swinhoe)	Rare	NE
33		Archduke Female	*Lexias pardelis* (Moore)	Rare	NE

(**LC:** Least Concern, **NE:** Not Evaluated).

et al.[2] This dominance may be due to the high availability of the host plants for the Nymphalids in the study area.[3] Additionally, the Nymphalids are active flier which helps them to cover large areas in search their resources.[22] Followed by the Nymphalids, the species from the Papilionidae family were recorded as the second highest in number. This is quite contradictory with the report of Saikia *et al.*,[6] as they recorded the Lycaenidae as the second dominant family. It may be due to the availability of the host plants of the Papilionidae family in the college campus. Similarly, a study of Gogoi[23] also recorded 21 number of species from the Papilionidae family in Jeypore-Dehing Rain Forest where 21 where semi ever green forest is found. As the college campus

Figure 3(a): Chocolate Demon.

Figure 3(b): Tiger Hopper.

Figure 3(c): Great Mormon.

Figure 3(d): Mettalic Cerulean.

Figure 3(e): Common Line Blue.

Figure 3(f): Dark Archduke Female.

Figure 3(g): Yellow Pansy.

Figure 3(h): Three Spotted Grass Yellow.

is very much closed to the Jeypore-dehing Rain Forest, it may also be the reason of the dominance of Papilionidae family in the college campus.

Among the 33 recorded species *Mycalesis gotama charaka* (Moore); *Lexias dirtea khasiana* (Swinhoe); *Lexias pardelis* (Moore) are listed under rare category by IUCN which is quite similar with the result of Saikia *et al.*,[2] The rare species are more prone to extinct in the ecosystem due to aggressive habitat destruction, pollution, changes in the physical and chemical environment and overexploitation.[24] Furthermore, in the present study, butterfly species from Hesperiidae and Pieridae were recorded with the least number, which may be due to the decline of their suitable host plants or the timing of observations.[25] Additionally, they may not be seen during the college hours when the study was going on as they are active flyer in the morning times. The study revealed that the campus of the college has a high butterfly diversity and can claimed that the college has a pollution-free campus as the butterflies are considered as the bio-indicators. Moreover, college has the large hives of honey bee which also supports the claim of a pollution-free campus. But there may be also some limitations of the study as the study carried out in the college hours (9.00 am to 11.00 am), the highest activity of the butterflies may not be observed at that time frame as maximum lepidopteran activity could be observed during the morning time. Also, the seasonal variations may also affect the result of this present investigation as the availability of the butterflies also depends on the seasons.[26]

CONCLUSION

The present study deals with the butterfly of Tingkhong College campus of Dibrugarh, Assam. The results somehow depict the rich biodiversity and the pollution-free campus of the college. It will also help in ensuring the conservation of these living jewels by identifying what is critical for the survival of the species, especially for the rare ones which have a very fine geographical habitat. This study will help to take necessary steps for the conservation of these beautiful creatures in its natural habitat.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All the procedures performed in the current studies were in accordance with the ethical standards of the institution and/or the national research committee. The consent was taken from the all authors to publish the article.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

IUCN: International Union for Conservation of Nature and Natural Resources; **NE:** Not evaluated; **DD:** Data deficient; **LC:** Least concern; **NT:** Near threatened; **VU:** Vulnerable; **EN:** Endangered; **CR:** Critically Endangered.

SUMMARY

Butterflies are one of the most beautiful creatures in the world due to their charming and aesthetic behaviour. The present study on the diversity of butterflies in the Tingkhong College campus will rationalize the scenic beauty of the college campus. Somehow, the study also justified the pollution-free campus of the college with a potential biodiversity hub. The availability of the Nymphalids on the campus depicts that the college has a diverse flora of high canopy level, which are considered the host plants by the butterflies of the Nymphalidae family. Furthermore, the second-highest dominance of the butterflies from the Papilionidae family indicates the presence of semi-evergreen flora on the campus as it is somehow close to the Jeypore-Dehing Rain Forest.

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