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Original Research Article

Checklist of Butterflies from Kurukani Forest Village, Sivasagar, Assam, India

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ABSTRACT:
A preliminary checklist was constructed to analyse the richness of butterfly fauna in the Kurukani Forest Village of Sivasagar district, Assam, from February 2020 to August 2021. During the study, a total of 76 species of butterflies belonging to six different families were recorded. The family Nymphalidae was found to be the most dominant with 33 species, followed by Hesperiidae, Lycaenidae, Papilionidae, and Pieridae. The family Riodinidae, on the other hand, had only one species. Except for *Euploea mulciber* (Cramer, 1777), which is listed as vulnerable on the IUCN Redlist, the majority of the recorded species have not been assessed by IUCN. The present study is the first of its kind in the study area, providing baseline data on the butterfly diversity in Assam's Kurukani Forest Village.

Keywords: Checklist, Butterfly, Sivasagar, Vulnerable, IUCN

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INTRODUCTION

The lepidopteran insects, especially the butterflies are considered to be one of the potential ecological indicators of forest health (Rosenberg et al., 1986; New et al., 1995; Beccaloni and Gaston, 1995; Oostermeijer and van Swaay, 1998; Sharma and Sharma, 2017). As butterflies are sensitive to climatic variations, they are often used to study the effects of climate change (Brereton et al., 2011; Zografou et al., 2014). Moreover, they help to restore the ecosystem by supplying pollination and a source of food (Ghazanfar et al., 2016). The study of butterfly diversity is necessary because its diversity serves as a surrogate for plant diversity. After all, butterflies are mostly dependent on plants (Janz et al., 2006; Ferrer-Paris et al., 2013).

More than 17,000 species of butterflies may be found all across the world, with India being home to approximately 1501 of them (Tiple, 2011). The north-eastern part of India is one of the most important hotspots of butterfly biodiversity, particularly in Assam, which is

exceptionally rich in butterfly diversity. Assam alone supports about 50% of the total butterfly species in India (Kumar, 2017). The greatest diversity of butterflies in this region is due to its diverse plant communities, habitats, and topography, which primarily influence the distribution pattern, diversity, and abundance of butterfly fauna. Although in the recent past, several researchers have studied butterflies in some districts, institutional campuses, and some forests of Assam, not much work has been done in the forest villages of Assam. As a result, the exact status of butterflies, particularly in the forest villages of Assam, is still not known due to a lack of proper survey.

Sivasagar district is one of the 33 districts of Assam in Northeast India which is famous for its rich biodiversity. It includes many reserve forests, viz., Dilli Reserve Forest, Geleky Reserve Forest, Abhaypur Reserve Forest, Diroi Reserve Forest, and Chala Reserve Forest. There are 21 forest villages. Although the district is famous for its biodiversity, no such literature or publications concerning butterflies in forest reserves and forest villages of this district could be traced. Hence, an attempt was made to study the diversity of butterflies in Kurukani Forest village of Sivasagar district, Assam.

MATERIALS AND METHODS

The present study was conducted in the Kurukani Forest Village, covering an area of about 142 hectares in the Diroi (Rangoli) Reserve Forest situated in the Sivasagar District of Assam. Different sites in the area were chosen to prepare an inventory. For the monitoring of butterfly diversity, the checklist survey method was conducted for a period of 18 consecutive months from February 2020 to August 2021.For the documentation of butterflies, photographs were taken in their natural habitat during the daytime, and species identification was done following Haribal (1992), Kehimkar (2008), Gupta and Majumdar (2006), and Singh (2011).

RESULTS AND DISCUSSION

Altogether, 76 species of butterflies belonging to six different families were recorded during the study [Table 1(a)–(e)]. The photographs of some collected butterflies are depicted in Figure 1. The Nymphalidae family was reported to be the most prominent, with 21 genera and 33 species, followed by Hesperiidae (15 genera and 17 species), Lycaenidae (11 genera and 12 species), Papilionidae (2 genera and 8 species), Pieridae (4 genera and 6 species), and Riodinidae (one species) (Figure 2). Among the total species richness, 11 species of butterflies came under the Indian Wildlife (Protection) Act, 1972. Among those species, *Euchrysops cnejus, Anthene lycaenina*, *Charaxes solon*, *Euthalia aconthea*, *Tanaecia lepida, Charaxes bernardus and Dophla evelina* under Schedule-II, whereas *Euthalia lubentina*, *Euploea mulciber*, *Baoris farri* and *Hyarotis adrastus* under Schedule-IV. However, themajority of the recorded species were reported as not evaluated, whereas only three species were assessed by IUCN. The *Pieris brassicae* from the Pieridae family were assessed as the Least Concerned (LC) category, whereas *Danaus chrysippus* and *Euploea mulciber* (Figure 3) from the Nymphalidae family were assessed as the LC and Vulnerable (VU) categories of the IUCN Redlist respectively. Depending on the occurrence of butterfly species in the study area, 35 species were considered to be common, 25 uncommon and 16 rare. During the study period, the highest numbers of butterfly species were recorded in July, August and September, because the richness of butterfly species was primarily affected by higher humidity, more rainfall, and approaching summer (Priya et al., 2017). However, some butterflies, like *Pieris* spp., were found to be predominant only from February–April and absent in the later months. While *Pseudozizeeria maha* and *Zizeeria karsandra* were found in large numbers throughout the study period. It was observed that the dominance of the Nymphalidae family during the study period may be attributed to their polyphagous nature, for which they stay in all habitats and their active flying nature that enables them to search a greater area for resources (Forsayeth, 1884). In the present study, the highest number of butterfly individuals was observed in the garden area, which may be due to the availability of larval host plants and adult nectar plants.

Table 1(a): List of Papilionidae butterflies found in the study area

Common Name	Scientific Name	Recorded Month	Local Status	IUCN Red List status	WPA, India (1972) Schedule
Red Helen	*Papilio helenus* (Linnaeus, 1758)	August-September	Common	NE	NA
Common Mormon	*Papilio polytes romulus* (Cramer, 1775)	April-August	Common	NE	NA
Common Peacock	*Papilio bianor* (Cramer, 1777)	August-September	Uncommon	NE	NA
Common Jay	*Graphium doson* (C. & R. Felder, 1864)	June	Uncommon	NE	NA
Lime butterfly	*Papilio demoleus* (Linnaeus, 1758)	June-September	Common	NE	NA
Paris Peacock	*Papilio paris* (Linnaeus, 1758)	July-September	Uncommon	NE	NA
Great Mormon	*Papilio memnon* (Linnaeus, 1758)	August-September	Uncommon	NE	NA
Spangle	*Papilio protenor* (Cramer, 1775)	September	Uncommon	NE	NA

*NE – Not Evaluated, NA – Not available

Table 1(b): List of butterflies of Pieridae family recorded in the study area

Common Name	Scientific Name	Recorded Month	Local Status	IUCN Red List status	WPA, India (1972) Schedule
Large White	*Pieris brassicae* (Linnaeus, 1758)	March-June	Uncommon	LC	NA
Indian Cabbage White	*Pieris canidia* (Linnaeus, 1768)	February-July	Common	NE	NA
Common Grass Yellow	*Eurema hecabe* (Linnaeus, 1758)	May-September	Common	NE	NA
Three-spot Grass Yellow	*Eurema blanda* (Boisduval, 1836)	May-September	Common	NE	NA
Psyche	*Leptosia nina* (Fabricius, 1793)	September	Not common	NE	NA
Common Emigrant	*Catopsilia pomona* (Fabricius, 1775)	July-September	Common	NE	NA

*NE – Not Evaluated, NA – Not available, LC-Least concern

Table 1(c): List of Lycaenidae butterflies found in the study area

Common Name	Scientific Name	Recorded Month	Local Status	IUCN Red List status	WPA, India (1972) Schedule
Common Lineblue	*Prosotas nora* (C. Felder, 1860)	June-September	Common	NE	NA
Purple Sapphire	*Heliophorus epicles* (Godart, 1824)	April	Rare	NE	NA
Copper Flash	*Raphala pheretima* (Hewitson, 1863)	May	Rare	NE	NA
Gram Blue	*Euchrysops cnejus* (Fabricius, 1798)	June	Uncommon	NE	Schedule II
Common Cerulean	*Jamides celeno* (Cramer, 1775)	May	Uncommon	NE	NA
Pale Grassblue	*Pseudozizeeria maha* (Kollar, 1844)	March-September	Common	NE	NA
Dark Grassblue	*Zizeeria karsandra* (Moore, 1865)	March-September	Common	NE	NA
Pointed Ciliate Blue	*Anthene lycaenina* (Felder, 1868)	July	Very Rare	NE	Schedule II
Zebra Blue	*Leptotes plinius* (Fabricius, 1793)	August	Rare	NE	NA
Slate flash	*Rapala manea* (Hewitson, 1863)	September	Uncommon	NE	NA
Common Imperial	*Cheritra freja* (Fabricius, 1793)	September	Rare	NE	NA
Common tit	*Hypolycaena erylus* (Godart, 1823)	August	Rare	NE	NA

*NE – Not Evaluated, NA – Not available

Table 1(d): List of Nymphalidae butterflies found in the study area

Common Name	Scientific Name	Recorded Month	Local Status	IUCN Red List status	WPA, India (1972) Schedule
Common Palmfly	*Elymnias hypermnestra*	May-September	Common	NE	NA
Black Rajah	*Charaxes solon* (Fabricius, 1793)	August	Rare	NE	Schedule II
Indian Fritillary	*Argynnis hyperbius* (Linnaeus, 1763)	May	Uncommon	NE	NA
Common Leopard	*Phalanta phalanta* (Drury, 1773)	May-June	Uncommon	NE	NA
Common Baron	*Euthalia aconthea* (Cramer, 1777)	May-September	Uncommon	NE	Schedule II
Gaudy Baron	*Euthalia lubentina* (Cramer, 1777)	August	Very Rare	NE	Schedule IV
Grey Count	*Tanaecia lepida* (Butler, 1868)	July-September	Common	NE	Schedule II

Plain Tiger	*Danaus chrysippus* (Linnaeus, 1758)	April-July	Common	LC	NA
Chocolate Pansy	*Junonia iphita* (Cramer, 1779)	May-September	Common	NE	NA
Angled Red Forester	*Lethe chandica* (Moore, 1858)	May	Rare	NE	NA
Grey Pansy	*Junonia atlites* (Linnaeus, 1763)	June-September	Common	NE	NA
Blue Tiger	*Tirumala limniace* (Cramer, 1775)	June	Common	NE	NA
Common Four Ring	*Ypthima huebner*i (Kirby, 1871)	March	Rare	NE	NA
Common Five Ring	*Ypthima baldus* (Fabricius,1775)	March-September	Common	NE	NA
Striped Blue Crow	*Euploea mulciber* (Cramer, 1777)	June	Rare	VU	Schedule IV
Towny Rajah	*Charaxes bernardus* (Fabricius, 1793)	August	Rare	NE	Schedule II
Common Bushbrown	*Mycalesis perseus* (Fabricius, 1775)	June-September	Rare	NE	NA
Long Branded Bushbrown	*Mycalesis visala* (Moore, 1858)	July	Common	NE	NA
Dark Branded Bushbrown	*Mycalesis mineus* (Linnaeus, 1758)	July-August	Common	NE	NA
Common Sailor	*Neptis hyla* (Linnaeus, 1758)	June-July	Common	NE	NA
Common Lascer	*Pantoporia hordonia* (Stoll, 1790)	August-September	Uncommon	NE	NA
Lemon Pansy	*Junonia lemonias* (Linnaeus, 1758)	June-September	Common	NE	NA
Common Evening Brown	*Melanitis leda* (Linnaeus, 1758)	April-September	Common	NE	NA
Tailed Palmfly	*Elymnias caudate* (Butler, 1871)	June	Uncommon	NE	NA
Tiger Palmfly	*Elymnias nesaea* (Linnaeus, 1764)	June-August	Common	NE	NA
Common Nawab	*Charaxes athamas* (Drury, 1773)	August	Very Rare	NE	Schedule II
Striped tiger	*Danaus genutia* (Cramer, 1779)	July-August	Common	NE	NA
Red-spot duke	*Dophla evelina* (Stoll, 1790)	September	Very Rare	NE	NA
Colour Sergeant	*Athyma inara* (Westwood, 1850)	September	Rare	NE	NA
Long-Branded Blue Crow	*Euploeaalgea* (Godart, 1819)	September	Uncommon	NE	NA
Great Eggfly	*Hypolimnas bolina* (Linnaeus, 1758)	May-September	Common	NE	NA
Commander	*Moduza procris* (Cramer, 1777)	September	Rare	NE	NA
Peacock Pansy	*Junonia almana* (Linnaeus, 1758)	July-September	Common	NE	NA

*NE – Not Evaluated, NA – Not available, VU-Vulnerable, LC-Least concern

Table 1(e): List of Hesperiidae butterflies found in the study area

Common Name	Scientific Name	Recorded Month	Local Status	IUCN Red List status	WPA, India (1972) Schedule
Common Banded Demon	*Notocrypta paralysos* (Wood-Mason & de Niceville, 1881)	June-July	Uncommon	NE	NA
Small Branded	*Pelopidas mathias* (Fabricius, 1798)	September	Common	NE	NA
Bispot Banded Ace	*Halpe porus* (Mabille, 1877)	September	Rare	NE	NA
Chocolate Demon	*Ancistroides nigrita* (Latreille, 1824)	July-September	Common	NE	NA
Small Paint-brush Swift	*Baoris chapmani* (Evans, 1937)	July-September	Uncommon	NE	NA
Black Paint Brush Swift	*Baoris farri* (Moore, 1878)	August-September	Common	NE	Schedule IV
Common Banded Awl	*Hasora chromus* (Cramer, 1780)	April-September	Uncommon	NE	NA
Common Palm Dart	*Telicota colon* (Fabricius, 1775)	August-September	Uncommon	NE	NA
Grass Demon	*Udaspes folus* (Cramer, 1775)	September	Uncommon	NE	NA
Giant Redeye	*Gangara thyrsis* (Fabricius, 1775)	September	Uncommon	NE	NA
Dun Skipper	*Euphyes vestris* (Boisduval, 1852)	September	Uncommon	NE	NA
Rice swift	*Borbo cinnara* (Wallace, 1866)	August-September	Common	NE	NA
Common Branded Redeye	*Matapa aria* (Moore, 1865)	September	Uncommon	NE	NA
Yellow-fringed Swift	*Caltoris aurociliata* (Elwes & Edwards, 1897)	September	Rare	NE	NA
Blank Swift	*Caltoris kumara* (Moore, 1878)	September	Uncommon	NE	NA
Dark Velvet Bob	*Koruthaialos butleri* (de Niceville, 1884)	September	Common	NE	NA
Dark Palm-Dart	*Telicota bambusae* (Moore, 1878)	September	Common	NE	NA
Tree flitter	*Hyarotis adrastus* (Cramer, 1780)	September	Uncommon	NE	Schedule IV

Figure 1: Photographs of some recorded butterflies in the study area. A – Indian fritillary, B – Common Baron, C – Common Nawab, D – Paris Peacock, E – Gram Blue, F – Common Four Ring, G – Grey pansy, H – Common Imperial, I – Pointed Ciliate Blue, J – Common Leopard, K – Blue Tiger, L – Psyche, M – Tawny Rajah, N – Tree flitter, O – Long-branded Blue Crow, P – Angled Red Forester, Q – Grey Count, R – Black Rajah (Photo credit – D. Deori)

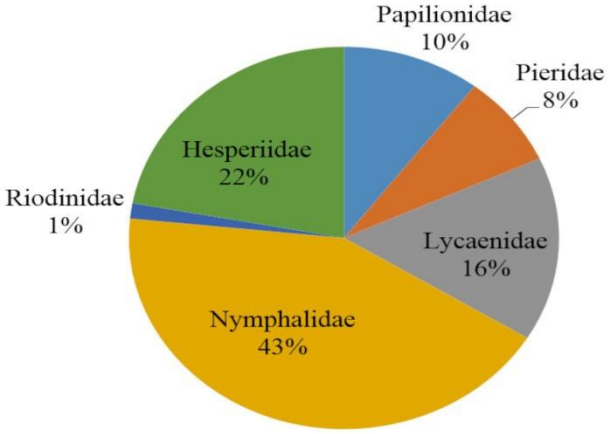

Figure 2: Pie diagram describing the composition of butterfly species (in percentage) of different families.

Figure 3: Photograph of Striped Blue Crow *Euploea mulciber* (Cramer, 1777)

CONCLUSION

Although the present study was conducted for a short period, it recorded a good number of butterfly species. This is the first study exploring the butterfly community in Kurukani Forest Village. It is expected that this study will provide baseline information to assess the diversity and conservation of butterflies in the study area. However, further study over a longer period will be needed for the proper assessment of butterfly fauna.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

1. Beccaloni, G.W. and Gaston. K.J. (1995). Predicting the species richness of Neotropical forest butterflies: Ithominae (Lepidoptera: Nymphalidae) as indicators. *Biological Conservation,* 71, 77-86.
2. Brereton, T.M., Roy, D.B., Middlebrook, I., Botham, M. and Warren, M. (2011). The development of butterfly indicators in the United Kingdom and assessments in 2010. *Journal of Insect Conservation,* 15(1-2), 139-151.

3. Ferrer-Paris, J.R., Sánchez-Mercado, A., Viloria, A.L. and Donaldson, J. (2013). Congruence and diversity of butterfly-host plant associations at higher taxonomic levels. *PLoS One,* 8(5), e63570.

4. Forsayeth, R.W. 1884. Life history of sixty species of Lepidoptera observed in Mhow, Central India. *Transaction of the Entomological Society of London* 3, 377-419.

5. Ghazanfar, M., Malik, M.F., Hussain, M., Iqbal, R. and Younas, M. (2016). Butterflies and their contribution in ecosystem: A review. *Journal of Entomology and Zoology Studies,* 4(2), 115-118.

6. Gupta, I.J. and Majumdar, M. (2012). Handbook on Diversity in Some of the Indian Butterflies (Insecta: Lepidoptera). Zoological Survey of India.

7. Haribal, M. (1992). The butterflies of Sikkim Himalaya and their natural history. Sikkim Nature Conservation Foundation, Gangtok.

8. Janz, N., Nylin, S., Wahlberg, N. (2006). Diversity begets diversity: host expansions and diversification of plant-feeding insects. *BMC Evolutionary Biology* 6, 4.

9. Kehimkar, I. (2008). The Book of Indian Butterflies. Bombay Natural History Society, Oxford University Press, Mumbai.

10. Lodh, R. and Agarwala, B.K. (2015).Inventory of butterfly fauna (Lepidoptera: Rhopalocera) of Tripura, India, in the Indo-Myanmar biogeographical zone, with records of threatened taxa. *Checklist,*11(2), 1591

11. New, T.R., Pyle, R.M., Thomas, J.A., Thomas, C.D. and Hammond, P.C. (1995). Butterfly conservation management. *Annual review of entomology,* 40(1), 57-83.

12. Oostermeijer, J.G.B., van Swaay, C.A.M. (1998). The relationship between butterflies and environmental indicator values: a tool for conservation in a changing landscape. Biological Conservation, 86, 271-280.

13. Priya, L., Krishnaraj, V. and Janaranjini, S. (2017). Studies on butterfly diversity in adichanalloor Village, Kollam District, Kerala. *Journal of Entomology and Zoology Studies,* 5(5), 73-81.

14. Rosenberg, D.M., Danks, H.V., Lehmkuhl, D.M. (1986). Importance of insects in environmental impact assessment. *Environmental Management,* 10, 773-783.

15. Sharma, M. and Sharma, N. (2017). Suitability of Butterflies as Indicators of Ecosystem Condition: A comparison of Butterfly Diversity across four habitats in Gir Wildlife Sanctuary. *International Journal of Advanced Research in Biological Sciences,* 4(3), 43-53.

16. Singh, A.P. (2011). Butterflies of India.OM books International, Delhi.

17. Tiple, A. D. (2012). Butterfly species diversity, relative abundance and Status in Tropical Forest Research Institute, Jabalpur, Madhya Pradesh, Central India. *Journal of threatened Taxa,* 4, 2713-2717.

18. Zografou, K., Kati, V., Grill, A., Wilson, R. J., Tzirkalli, E., Pamperis, L. N. and Halley, J. M. (2014). Signals of climate change in butterfly communities in a Mediterranean protected area. *PLoS One*, 9(1), e87245.

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