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A Review on diversity of Butterfly in North east India

Phulson Doley[1], Sangeeta Gogoi[2*], Dr. Gitalee Bhuyan[3]

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Abstract

Butterflies are of order Lepidoptera, and one of the most fascinating and ecologically significant group of insects that are often regarded as the flagship species. They are the good bio-indicators of the ecosystem. Their bodies are covered with tiny sensory hairs, and their 3 pairs of legs are attached to the thorax, allowing them to navigate and interact with their environment with remarkable precision. This paper is aimed to review the diversity of butterfly in the Northeastern states of India. A total of six families were recorded in North-east India which includes Nymphalidae, Papilionidae, Hesperiidae, Pieridae, Lycaenidae and Riodinidae. It has been noticed that family Nymphallidae is found to be the most dominant family in every state of North-east India whereas a smaller number of species recorded belonging to the Riodinidae family. Moreover, in Manipur highest butterfly species were recorded (278 species) belonging to the family Nymphallidae and followed by Meghalaya (127 species), Assam (118 species), Nagaland (102 species), Mizoram (88 species), Tripura (85 species) and Arunachal Pradesh (68 species). In case of total number of butterfly species, highest species diversity is recorded in Manipur (773) and lowest species diversity is found in Mizoram (136). Apart from Nymphallidae family, species were also recorded from the families such as Hesperiidae, Papilionidae, Pieridae, Lycaenidae, and Riodinidae.

Introduction

Butterflies, belonging to the order Lepidoptera, are one of the most fascinating and ecologically significant group of insects. With over 19,000 species worldwide (Sharma et al., 2018), butterflies are a diverse and widespread group, playing a vital role in pollination and ecological balance. These species of insects are characterized by presence of scales on their wings, which provide them with vibrant colors and intricate patterns, butterflies are not only aesthetically pleasing but also serve as valuable ecological indicators (Gilbert, 1984). Their bodies are covered in tiny sensory hairs, and their six legs are attached to the thorax, allowing them to navigate and interact with their environment with remarkable precision. The importance of butterflies extends beyond their beauty and ecological significance. As pollinators, they play a crucial role in maintaining the health of ecosystems and supporting biodiversity (Losey & Vaughan, 2006). Many plant species rely on butterflies as primary or secondary pollinators, and the loss of butterfly populations could have significant impacts on ecosystem function. Furthermore, butterflies are highly sensitive to changes in temperature, humidity, and light levels, making them useful indicators of environmental health (Murphy et al., 1990).

In India, butterflies are protected under the Wildlife Protection Act of 1972 (Sharma et al., 2018), recognizing their importance in maintaining ecological balance. The North-Eastern region of India, in particular, is known for its rich butterfly diversity, with numerous species documented and studied (Evans, 1932; Alfred et al., 2000). The region's unique geography, climate, and vegetation have created a hotspot for global biodiversity, with many species found nowhere else on Earth.

The region's average annual rainfall, which often exceeds 2,000 mm, creates an ideal environment for many floras and fauna, supporting a rich butterfly fauna (Atanu Bora & L.R. Meitei). This region is regarded as the home to a staggering 962 species of butterflies, many of which are endemic to this region (Alfred et al.,

[1,2,3] Department of Zoology, Madhabdev University, Assam, India, *Corresponding author's Email: sangeetagogoi66@gmail.com

2000). The dominant family, Nymphalidae, makes up almost half of the documented species, followed by Lycaenidae and Hesperiidae (Tshetsholo, Naro & Sanjay Sondhi, 2014). This diversity of butterflies is a reflection of the region's unique geography and climate, which has created a variety of habitats that support a wide range of species Despite the importance of this region, there is a need for a comprehensive review of the current knowledge on butterfly diversity, ecology, and conservation in North-East India. Thus, this review aims to provide a comprehensive overview of the current state of knowledge on butterfly diversity, ecology, and conservation in North-East region. Moreover, it will highlight the significance of this region and identify areas for future study and conservation efforts.

Empirical Literature

Assam

Bora and Meitei, 2014 conducted a study on butterfly diversity in Assam highlighting the region's rich butterfly fauna.They investigated the diversity of butterflies in Assam University campus and its vicinity, Cachar district, and recorded 96 species of butterflies belonging to 68 genera and five families. The family Nymphalidae was found to be the most dominant, with 34 species, followed by Lycaenidae (20 species), Hesperiidae (15 species), Pieridae (14 species), and Papilionidae (13 species).

Saikia, 2014, studied the diversity of tropical butterflies in urban altered forests at Guwahati University campus. The study found that the family Nymphalidae was the most dominant, with 59 species and few of which includes *Melanitis leda ismene, Elymnias malelas, M. mineus mineus, Orsotrioena medus* etc.

Ahmed et al., 2018 A preliminary study on butterfly diversity was done in Garbhanga Reserve Forest, Basistha, and found different species of butterfly from the region which includes; *Triumala septentrionis* from the family Nymphalidae, *Pieris napi* from the family Pieridae and so on.

Chutia et al., 2019 studied the diversity and abundance of butterflies in and around Sivasagar tank in Sivasagar District. They basically found many species of butterfly from different families. *Papilio polytes* L. *Papilio Memnon* L. were recorded from the family Papilionidae.

More recently, Bhuyan et al., 2023 conducted research on the diversity and species richness of butterflies in the Soraipung range of Dehing Patkai National Park and recorded a total of 92 butterfly species from 5 different families. The study found that members of the Nymphalidae family were dominant, with 41 species, followed by Papilionidae, Lycaenidae Hesperiidae and Pieridae. These studies collectively highlight the rich diversity of butterflies in Assam, with the family Nymphalidae consistently found to be the most dominant.

Arunachal Pradesh

Pachoni et al. (2012) documented the butterfly diversity in Pakke Tiger Reserve, revealing that Nymphalidae was the most abundant family, followed by Papilionidae, Pieridae, Lycaenidae, and Hesperiidae. Thecommonly recorded species are White dragon tail (*Lamproptera curius*), Common bluebottle (*Graphium Sarpedon*), Yellow Helen (*Papilio helenus*) from the family Papilionidae, Dark blue tiger (*Tirumala septentrionis*), Striped tiger (*Danaus genutia*) from the family Nymphalidae and so on.

Das et al. (2012) recorded 63 species of butterflies from the foothills of Itanagar, belonging to five families. Nymphalidae dominated the region, while Hesperidae was the least represented. During the study they captured some of commonly found species namely; Purple Sapphire (*Heliophorus epicles*), Common Hedge Blue (*Actolepis puspa*), Common Mormon (*Papilio polytes*), Common Birdwing (*Troides Helena*), Indian Cabbage White (*Pieris canidia*), and Glassy Tiger (*Parantica aglea*).

Chauhan et al. (2014) studied the butterfly diversity in the South-Eastern part of Namdapha Tiger Reserve and documented 113 species from 5 families and 73 genera. Nymphalidae was the most dominant family, with 48 species such as Dark blue tiger (*Tirumala septentrionis*), Blue spotted crow (*Euploea midamus*)

followed by Papilionidae such as Glossy blue bottle (*Graphium cloanthus*), Lycaenidae such as Common gem (*Poritia hewitsoni*), Pieridaes and Hesperiidae such as Branded orange awlet (*Bibasis oedipodae*).

Talukdar et al. (2014) investigated the butterfly diversity and altitudinal preferences in Talle Valley Wildlife Sanctuary. Their study revealed that Nymphalidae was the most dominant family, with 26 species, followed by Papilionidae, Pieridae, Lycaenidae, and Hesperiidae.

Nagaland

Naro and Sondhi 2014 They surveyed on butterflies in Chizami, Phek District, Nagaland, India, and recorded 212 species of butterflies. The family Nymphalidae was found to be the most abundant, followed by Lycaenidae and Hesperiidae family namely; Brown Awl (*Badamia exclamationis*), Green Awlet (*Bibasis vasutana*), Indian Awlking (*Choaspes benjaminii japonica)* etc. and so on.

More recently, Mishra et al., 2024 conducted a comparative analysis of butterfly populations in Zunheboto District, Nagaland. Their study recorded 43 species across six families, with Nymphalidae being the dominant family, comprising 24 species. The study also found that Pieridae comprised 22% (7 species), Lycaenidae comprised 17% (4 species), Papilionidae and Hesperiidae each comprised 12% (3 species each), and Riodinidae comprised 8% (2 species). The findings revealed the dominance of Nymphalids, showing their broad adaptation and diversity within habitats.

Manipur

Studies on butterfly diversity in Manipur have been conducted by various researchers. Singh et al. 2007conducted research on butterfly fauna of Bishnupur District, Manipur, and collected a total of 95 species belonging to 5 families. The family Nymphalidae was represented with a maximum of 41 species, followed by Lycaenidae with 21 species, Hesperiidae with 21 species, and Papilionidae with a minimum of 5 species, and Pieridae species were also recorded.

Gupta et al., 2011 conducted research on butterfly fauna of the Keibul Lamjao National Park, Manipur, North East India, from 2005 to 2008. During the study, a total of 117 species belonging to 79 genera under 18 subfamilies were collected.

Huidrom et al., 2020 researched on the diversity of butterfly species of Manipur, India, from 2010 to 2019, collecting from 80 localities. They recorded a total of 798 species, which is about 95.6% of species found in NE India. From the region they recorded mainly five family such as; Papilionidae, Pieridae, Riodiniidae, Lycaenidae, Nymphalidae and Hesperiidae.

Meghalaya

Sondhi et al., 2012 studied the butterflies of the Garo Hills of Meghalaya, Northeastern India, and recorded a total of 298 species from six different families. The family Nymphalidae was the most diverse, with 121 species, followed by Lycaenidae (72 species), Hesperiidae (48 species), Papilionidae (28 species), Pieridae (24 species), and Riodinidae (5 species).

Bora et al., 2014 studied butterfly species richness and diversity in the Experimental Botanic Garden, Meghalaya, India, and recorded a total of 66 species of butterflies belonging to five families. Papilionidae includes; Common Mormon (*Papilio polyte*s), Great Mormon (*Papilio memnon*), Hesperiidae includes; Common Grass Dart (*Taractrocera maevius*), Great Swift (*Pelopidas assamensis*), Pieridaeinlcues; Common Grass Yellow (*Eurema hecabe*), Nymphalidae includes; Plain Tiger (*Danaus chrysippus*).

Kumar et al., 2016 documented butterfly diversity in the campus of University of Science and Technology, Meghalaya, and recorded 127 species of butterflies. They found that, 35% are from the family Nymphalidae, 27% are from Lycaenidae, 14% are from the family Hesperiidae, and 11% are from Papilionidae.

Tripura

Majumder et al., 2012 studied the variation in butterfly diversity and unique species richness along different habitats in Trishna Wildlife Sanctuary, Tripura, and identified a total of 59 species in 48 genera belonging to five families. The family Nymphalidae was the most diverse, with 23 species, followed by Lycaenidae 13 species, Papilionidae 8 species, Hesperiidae 8 species), and Pieridae 7 species.

Roy et al., 2012 conducted a study on butterfly species diversity in Tripura and recorded a total of 196 species of butterflies from five different families. The family Nymphalidae was the most dominant. Some commonly recorded insect's species includes; White Dragontail (*Lamproptera curius*), Common Mime (*Chilasa clytia*) from the family Papilionidae, Small Grass Yellow (*Eurema brigitta*), Tree-spot Grass Yellow (*Eurema blanda*) belongs to the familiyPieridae, Indigo Flash (*Rapala varuna*), from the family Lycaenidae, Blue Tiger (*Tirumala limniace*) from Nymphalidae and Common Awl (*Hasora badra*) from Hesperiidae.

Along with these family they also studied about the others family of butterfly from theregion.

Lodh and Agrawala 2015 surveyed the diversity of butterfly fauna in the Indo-Myanmar biogeographical zone in Tripura and recorded a total of 212 species representing six families. Nymphalidae was the most diverse family, with 79 species, Lycaenidae 50 species, Hesperiidae 43 species, Pieridae 23 species, and Papilionidae 16 species. They also recorded 65 threatened species and 41 species protected by the Indian Wildlife Protection Act 1972.

Bhowmik and Chowdhury 2021 studied butterfly species diversity in and around the Unakoti Archaeological Site in Tripura, North-eastern India, and documented a total of 216 species classified under six families, 23 subfamilies, and 126 genera.

Mizoram

Kumar et al. 2014 Study was conducted in Dampa Tiger Reserve of Mizoram from November 2010 to September 2012 and estimated a total of 125 butterfly species from five families. The family Nymphalidae was the most diverse, including *Tirumala septentrionis*, *Danaus genutia*, *Danaus chrysippus, Parantica aglea, Euploea agela, Charaxes marmax* followed by Pieridae includings; *Ixias pyrene, Hebomoia, Appias lyncida, Appias albina, Pieris napi, Delias pasithoe, Eurema sari, Castopsila Pomona*, Hesperiidae such as; *Aeromachusjhorajhora, Astychus pythias, Pelopidas mathias, Oriensglolaides, Celaenorrhinus pulomaya* and Lycaenidae such as; *Hypolycaena erylus, Talicada nyseus Abiosarafylla* etc.

Solanki and Khanal 2015 surveyed the diversity of butterfly species in the Mizoram University campus and recorded a total of 3,618 individuals of 78 species belonging to six different families. The family Nymphalidae was found to be the most dominant. These studies also signify the rich in the diversity of butterfly's species in the state. Along with that, these studies collectively highlight the most dominant family of the region across different habitats, emphasizing the region's ecological significance and the need for conservation efforts.

SI.No	Name of state	Name of Family	Number of species	Total species	Common Family	Rare family	References
	Assam	Nymphalidae	118	250	Nymphalidae	Riodinidae	Bora and Meitei, 2014;Saikia2014; Ahmed et al. 2018;
1		Papilionidae	34				Chutia dt al. 2018; Bhuyan et al. 2023
		Hesperiidae	32				
		Pieridae	25				
		Lycaenidae	40				
		Riodinidae	1				
	Arunachal	Nymphalidae	68	158	Nymphalidae	Riodinidae	Pahoni et al. 2012;
2	Pradesh	Papilionidae	30				Das et al. 2012;
		Hesperiidae	14				Chauhan et al. 2014; Talukdar et al. 2014
		Pieridae	20				
		Lycaenidae	26				
		Riodinidae	0				
3	Nagaland	Nymphalidae	102	182	Nymphalidae	Riodinidae	Naro and Sondhi 2014;
		Papilionidae	3				Mishra et al. 2024;
		Hesperiidae	30				
		Pieridae	7				
		Lycaenidae	38				
		Riodinidae	2				
4	Manipur	Nymphalidae	278	773	Nymphalidae	Riodinidae	Singh et al. 2007;
		Papilionidae	9				Gupta et al. 2011;Huidrom et al. 2020;
		Hesperiidae	198				
		Pieridae	39				
		Lycaenidae	232				
		Riodinidae	17				
5	Meghalaya	Nymphalidae	127	357	Nymphalidae	Riodinidae	Sondhi et al. 2012;
		Papilionidae	72				Bora et al. 2014;
		Hesperiidae	52				Kumar et al. 2016
		Pieridae	29				
		Lycaenidae	72				
		Riodinidae	5				
6	Tripura	Nymphalidae	85	226	Nymphalidae	Riodinidae	Majumder et al.2012.,
		Papilionidae	18				Roy et al.2012
		Hesperiidae	46				Lodh and Agrwala.2015;
		Pieridae	27				Bhowmik and Chowdhry 2021;
		Lycaenidae	50				
		Riodinidae	0				
7	Mizoram	Nymphalidae	88	136	Nymphalidae	Riodinidae	Kumar et al. 2014; Solanki and Khanal 2015
		Papilionidae	12				
		Hesperiidae	10				
		Pieridae	18				
		Lycaenidae	8				
		Riodinidae	0				

Table 1: List of butterfly families recorded from different state of North-east India.

Conclusion

Butterflies are very significant insects for pollinating different plant or crop varieties. Throughout the Northeastern states, Nymphallidae family remains the largest representing family with a great diversity of butterfly species belonging to it. A detailed survey can only establish the current status of the butterfly diversity; therefore, assays should be made to updated sporadically which will help in the conservation process of butterfly. In the recent years remarkable work has been done by different researchers in terms of butterfly diversity in the Northeastern region but still attempts should be made to start work upon on different protected areas and sanctuaries. Moreover, monitoring of butterfly diversity in cities and towns should also be initiated as there is ultimate need of initiation in those areas.

References

Singh, M. I., & Varatharajan, R. (2007). Butterfly Fauna of Bishnupur District, Manipur. *HEXAPODA*, 5-8.
Singh, M. I., Gupta, A., & Varatharajan, R. (2011). Butterfly fauna of the KeibulLamjao National Park, Manipur, North East India. *Current Science (00113891)*, *101*(6).
Kunte, K., Sondhi, S., Sangma, B. M., Lovalekar, R., Tokekar, K., & Agavekar, G. (2012). Butterflies of the Garo Hills of Meghalaya, northeastern India: their diversity and conservation. *Journal of Threatened Taxa*, 4(10), 2933-2992.
Das, R. P., Balakrishnan, V., Nelson, R., Sasikumar, K., & Roy, A. B. (2012). Butterflies of Tripura. Biodiversity and Taxonomy, Narendra Publishing House, Delhi, 279-289.
Majumder, J., Lodh, R., & Agarwala, B. (2012). Variation in butterfly diversity and unique species richness along different habitats in Trishna Wildlife Sanctuary, Tripura, northeast India. Check list, 8(3), 432-436.
Sebastian, J., &Pachoni, A. K. (2012). Some observations on butterflies of Pakke tiger reserve, Arunachal Pradesh. *Indian Forester*, 138(10), 897.
Sarma, K., Kumar, A., Devi, A., Mazumdar, K., Krishna, M., Mudoi, P., & Das, N. (2012). Diversity and habitat association of butterfly species in foothills of Itanagar, Arunachal Pradesh, India. *biotech Journal of Zoology*, 1(2), 67-77.
Bora, A., Meitei, L. R., & Deb, M. (2014). Butterfly species richness and diversity in experimental botanic garden, botanical survey of India, ERC, Umiam, Meghalaya, India. *Journal of Entomology and Zoology Studies*, 2(5), 108-113.
Naro, T., & Sondhi, S. (2014). Butterflies (Lepidoptera) of Chizami, Phek District, Nagaland, India. *Journal of threatened taxa*, 6(13), 6593-6634.
Sethy, J., Behera, S., & Chauhan, N. S. (2014). Species diversity of butterflies in south-eastern part of Namdapha Tiger Reserve, Arunachal Pradesh, India. *Asian Journal of Conservation Biology,* 3(1), 75-82.
Talukdar, Y., & Sharma. (2014). Butterfly diversity and altitudinal preferences in talle valley wildlife sanctuary, lower subansiri district, Arunachal Pradesh, India. *Journal of Bioresources* 1(1): 38-44.
Saikia, M. K. (2014). Diversity of tropical Butterflies in urban altered forest at Guwahati University campus, Jalukbari, Assam, India. *Journal of Global Biosciences*, 3(2), 452-463.
Chakraborty, M. (2015). Butterflies-The Natural Treasure of North East India. International *Journal of Research and Scientific Innovation*, 2(10), 159-160.
Majumder, J., &Lodh, R. (2015). Inventory of butterfly fauna (Lepidoptera: Rhopalocera) of Tripura, India, in the Indo-Myanmar biogeographical zone, with records of threatened taxa. *Check List*, 11(2), 1-37.
Kumar et al. (2016). A checklist of diversity of butterflies in the campus of University of Science and Technology, Meghalaya (USTM), Ri-bhoi district, Meghalaya.*Journal ofEntamology and Zoology Studies*,5(1): 717-724.
Nair, N., Giri, U., Debnath, M. R., & Shah, S. K. (2018). Butterfly fauna (Lepidoptera: Rhopalocera) of Lembucherra, West Tripura, Tripura, India. *Journal of Entomology andZoology Studies*, 6(2), 975-981
Medhi, J., Barman, J., & Sharma, S. (2018). Assessment on butterfly and its diversity in Tegheria (Waterfall), Dimoria development Block, Kamrup (M) district of Assam, India. *Journal of Entomology and Zoology Studies*, *6*(3), 1746-1750.

Modak, S., Das, A. N., & Ahmed, R. Ahmed, R. (2018). A preliminary study on butterfly diversity in Garbhanga Reserve Forest, Basistha, Assam, India.” *Asian Resonance*, 7(3), 16-24.

Kaushik, K. K., Sahu, P., & Chutia, B. C (2020). Diversity and abundance of butterflies in and around Sivasagar tank (Borpukhuri), in Sivasagar District, Assam, India.Eco. *Env. & Cons.* 26(1): 135-141

Gogoi, R., Chetry, A., & Bhuyan, A. (2023). Diversity and species richness of butterfly in soraipung range of Dehing Patkai National Park, Assam, India. *The Journal of Basic andApplied Zoology*, 84(1), 6.

Mishra, J. R., Richumi, T. K., & Deb, M. (2024). Diversity of Lepidoptera: A Comparative Analysis of Butterfly Populations in Zunheboto District, Nagaland, India.