

# Seasonal diversity and habitat patterns of butterflies in Nagaon district of Assam, India

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## Abstract

Between 2025 and 2026, a year-long survey was undertaken across varied habitats of Nagaon District, Assam, India, to investigate butterfly diversity and seasonal dynamics. Field assessments were carried out in wetlands, riverine forests, grasslands, tea plantations, village woodlands, and the floodplain ecosystems of Laokhowa and Burhachapori Wildlife Sanctuaries. Using standardized Pollard walk transects complemented by opportunistic observations, butterflies were recorded during pre-monsoon, monsoon, post-monsoon, and winter seasons. In total, 89 species representing six families were documented, with *Nymphalidae* and *Lycaenidae* being the most prominent. Species richness reached its highest during the post-monsoon season and remained relatively elevated in winter. Protected floodplain habitats supported the greatest diversity, whereas urbanized landscapes exhibited reduced richness. This study establishes a valuable baseline for butterfly conservation and ecological monitoring in central Assam, underscoring the role of floodplain sanctuaries in sustaining regional biodiversity.

**Keywords:** Butterfly diversity, Nagaon District, Assam, Seasonal variation

## Introduction

Butterflies are among the most important bio-indicators of terrestrial ecosystems because of their high sensitivity to environmental fluctuations, habitat alteration, climate change and vegetation dynamics (Kremen C. 1992) [10]. Their close ecological association with host plants, nectar resources, and microclimatic conditions makes them valuable organisms for monitoring ecosystem health and biodiversity conservation (Thomas J.A., 2005) [16]. Changes in butterfly assemblages often reflect ecological disturbances such as deforestation, urbanization, wetland degradation, agricultural intensification and climatic variability (Kocher S.D. & Williams E.H., 2000). Consequently, butterfly diversity studies are widely used in ecological assessment, habitat quality evaluation, and long-term environmental monitoring programs worldwide (Pollard E. & Yates T.J., 1993) [14].

India is recognized as one of the global centers of butterfly diversity, supporting nearly 1,500 species, of which a substantial proportion occurs in the northeastern region (Kunte K., 2000) [11]. Northeast India forms part of the Indo-Burma biodiversity hotspot and the Indo-Malayan biogeographic realm, both of which are known for exceptionally high species richness and endemism (Myers N. *et al.*, 2000) [12]. The region's complex topography, high rainfall, tropical climate, and diverse vegetation types create favorable habitats for a wide variety of butterfly fauna (Haribal M., 1992) [6]. Assam, situated in the Brahmaputra Valley of Northeast India, represents a biologically rich transition zone between the Eastern Himalaya and Indo-Malayan regions and harbors

diverse ecosystems including tropical forests, wetlands, riverine grasslands, agricultural landscapes, and foothill vegetation.

Several studies have documented the rich butterfly diversity of different parts of Assam and adjoining northeastern states. Notable contributions to butterfly studies in Northeast India were made by Evans W.H (1932), Wynter-Blyth M.A. (1957), Haribal M. (1992), and Kunte K. (2000) [4, 17, 6, 11]. In Assam, butterfly diversity studies have been conducted in protected areas and forest landscapes such as Kaziranga National Park, Nameri National Park, Dibru-Saikhowa Biosphere Reserve, Manas National Park, and various reserve forests (Gogoi, M.J., 2013; Singh & Gogoi, M.J., 2016) [5, 15]. These studies revealed the occurrence of several rare, endemic, and legally protected species associated with floodplain forests, grasslands, and tropical evergreen habitats. However, many districts of Assam, particularly those outside major protected areas, still remain poorly explored in terms of butterfly diversity and seasonal distribution patterns.

Nagaon District occupies a strategically important ecological position within the Central Brahmaputra Valley and contains a heterogeneous landscape comprising wetlands, floodplain grasslands, riverine forests, agricultural mosaics, tea gardens, foothill vegetation, village woodlands, and urban wetlands. The district also includes ecologically significant protected areas such as Laokhowa Wildlife Sanctuary and Burhachapori Wildlife Sanctuary, which function as an important wildlife corridor connected to the Kaziranga landscape (Choudhury A., 2004) [3]. The combination of wetlands, riparian habitats,

secondary forests, and cultivated landscapes provides diverse ecological niches suitable for a rich butterfly assemblage. Seasonal flooding, monsoonal climate, and varied vegetation structure further contribute to habitat heterogeneity and resource availability for butterflies throughout the year.

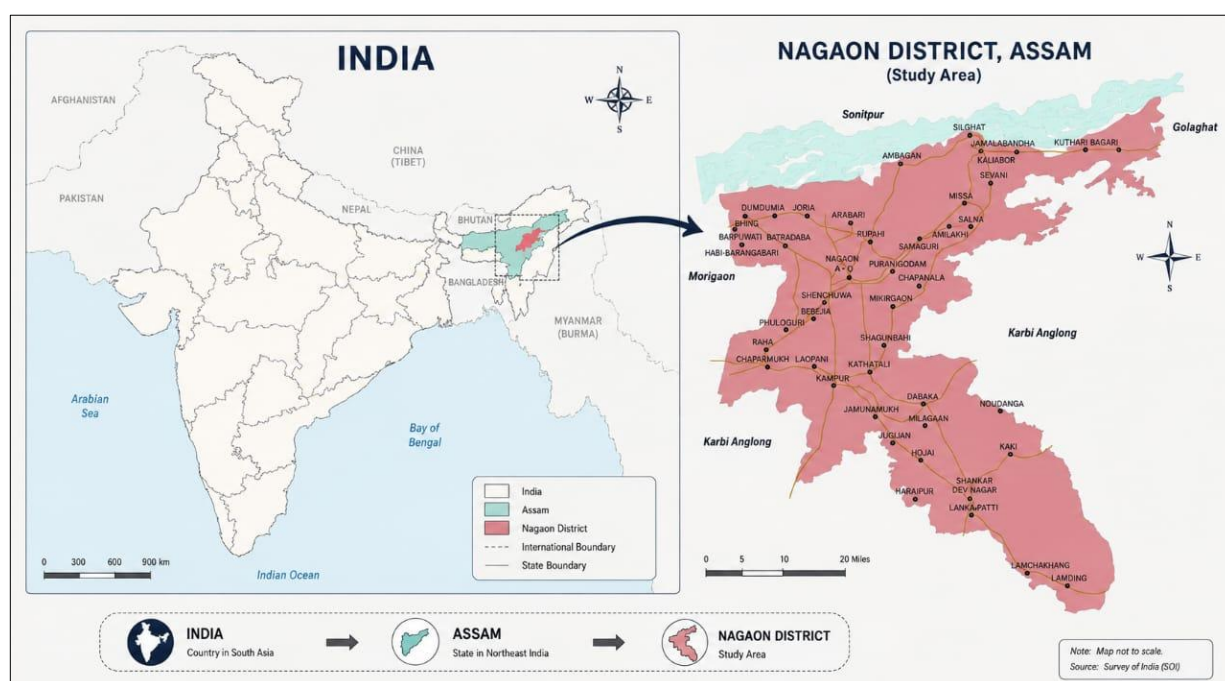
Despite the ecological significance of the region, comprehensive documentation of butterfly diversity in Nagaon District has remained limited. Most previous studies in Assam focused primarily on protected forest landscapes, while information regarding butterfly assemblages in mixed-use habitats, wetlands, tea estates, and rural landscapes of central Assam is comparatively scarce. Baseline documentation of species diversity, seasonal occurrence, habitat preference, and distribution is therefore essential for biodiversity assessment and future conservation planning.

The present study was undertaken to document the butterfly diversity of Nagaon District across different habitat types and seasons. The objectives of the study were to (i) prepare a

baseline checklist of butterfly species occurring in the district, (ii) analyze seasonal variation in butterfly richness and abundance, (iii) evaluate habitat-wise diversity patterns across major ecosystems and (iv) provide ecological information useful for future biodiversity monitoring and conservation initiatives in the Brahmaputra Valley region.

### Study area

The present study was conducted in Nagaon District of Assam, India, situated in the central part of the Brahmaputra Valley between 25°45'–26°45' N latitude and 91°50'–93°20' E longitude. The district occupies an area of approximately 2,287 km<sup>2</sup> and lies on the southern bank of the Brahmaputra River. Geographically, the district is bounded by Sonitpur District and the Brahmaputra River to the north, Karbi Anglong and Golaghat districts to the east, West Karbi Anglong and Hojai districts to the south, and Morigaon District to the west.



**Fig 1:** Map of the study area showing the geographical location and sampling sites surveyed during the study in Nagaon district, Assam, India

Physiographically, Nagaon District is characterized by extensive alluvial floodplains interspersed with low hillocks and foothill zones extending from the Karbi Anglong plateau. The terrain ranges from low-lying flood-prone plains near Silghat (~30–50 m a.s.l.) to elevated foothill areas such as Hatirnura Parbat (186.5 m) and Kamakhya Parbat (~244 m), while the average elevation of the district is about 61 m above sea level (KVK Nagaon, 2021). The present survey covered a wide range of habitats including Chapanala Waterfall, Laokhowa Wildlife Sanctuary, Burhachapori Wildlife Sanctuary, Deobali Jalah, Silghat, Morikolong Beel, the Kolong River corridor, tea estates, village woodlands, and adjoining foothill forests, with elevations ranging approximately from 30–140 m above sea level.

The climate of the district is humid tropical monsoon in nature, typical of the Central Brahmaputra Valley agro-climatic zone (Baruah U., et al., 2018) [1]. The region experiences heavy

monsoonal rainfall, receiving approximately 1,500–2,000 mm annually, most of which occurs during June to September (Meteorological Department of India, 2020). Summers are generally hot and humid with temperatures occasionally rising to 35–38°C, whereas winters remain mild to cool with minimum temperatures occasionally falling to 5–8°C. High atmospheric humidity, prolonged rainfall, and warm temperatures create favorable ecological conditions for diverse floral and faunal communities throughout the year.

The natural vegetation of the district comprises tropical moist deciduous forests, riverine forests, wet alluvial grasslands, marsh vegetation, bamboo brakes, and secondary woodland patches. The foothill forests adjoining Karbi Anglong are dominated by species such as *Shorea robusta*, *Terminalia spp.*, *Dipterocarpus spp.*, and associated tropical vegetation (Haridasan K. and Rao R.R., 1987) [7]. Floodplain habitats support extensive grasslands, riparian vegetation, and wetland

ecosystems that harbor rich biodiversity. Agricultural land use is widespread in the plains, where paddy cultivation dominates, while tea gardens and village agroforestry systems contribute significantly to habitat heterogeneity within the district (Baruah U., *et al.*, 2018) [1].

Two important protected areas included within the present study are Laokhowa Wildlife Sanctuary and Burhachapori Wildlife Sanctuary, situated along the southern bank of the Brahmaputra River. Laokhowa Wildlife Sanctuary covers approximately 70.13 km<sup>2</sup>, whereas Burhachapori Wildlife Sanctuary occupies about 44.06 km<sup>2</sup>. Together, these protected areas form an ecologically significant wildlife corridor connected to the Kaziranga landscape and serve as an important buffer zone for Kaziranga Tiger Reserve (Choudhury A., 2004) [3]. The landscape is dominated by wet alluvial grasslands, riverine woodlands, oxbow wetlands, and marsh ecosystems that support diverse wildlife including the Indian one-horned rhinoceros (*Rhinoceros unicornis*), Asiatic elephant (*Elephas maximus*), wild water buffalo (*Bubalus arnee*), Royal Bengal tiger (*Panthera tigris tigris*), hog deer (*Axis porcinus*), and numerous avifaunal species (Choudhury A, 2004) [3].

### Materials and Methods

Field surveys were conducted in different habitats of Nagaon District, Assam, India, from March 2025 to February, 2026 covering all major seasons, namely pre-monsoon, monsoon, post-monsoon, and winter. The surveys were designed to document butterfly diversity across representative ecosystems including wetlands, floodplain grasslands, riverine forests, tea gardens, village woodlands, foothill vegetation, and urban green spaces.

Butterfly sampling was carried out following the standard Pollard walk transect method developed for butterfly monitoring studies (Pollard E., 1977; Pollard E. and Yates T.J., 1993) [13, 14]. In each selected habitat, transects measuring approximately 1 km in length and 5 m in width were established depending upon habitat accessibility and vegetation structure. Transects were walked at a slow and uniform pace while recording all butterflies observed within the fixed transect boundary. Surveys were conducted during favourable weather conditions, avoiding heavy rainfall, strong winds, or dense cloud cover, as butterfly activity is strongly influenced by climatic conditions (Wynter-Blyth M.A., 1957; Kunte K., 2000) [17, 11].

Field observations were mainly carried out during peak butterfly activity periods between 08:00 hrs and 11:30 hrs, when sunlight intensity and nectar foraging activities are generally highest (Pollard E., 1977) [13]. Additional opportunistic observations were also recorded from adjoining habitats whenever encountered outside fixed transects. Butterflies were photographed in the field using digital cameras for subsequent identification and documentation. No specimens were collected except in cases requiring confirmation of doubtful identification through photographic examination.

Species identification was carried out using standard taxonomic literature and regional butterfly field guides including Evans W.H (1932) [4], Wynter-Blyth M.A. (1957) [17], Haribal M. (1992) [6], Kunte K. (2000) [11], and Kehimkar I. (2016) [9]. Scientific nomenclature and taxonomic arrangement were updated following recent Indian butterfly checklists and

available literature. Habitat-wise occurrence, seasonal presence, and relative abundance were documented from repeated field observations throughout the study period.

Species richness and diversity patterns were analyzed seasonally and habitat-wise using observational data collected during the surveys. Comparative analyses were performed to evaluate variation in butterfly occurrence among different habitats and seasons within the study area.

Seasonal surveys were carried out using Pollard walk transect methods between March 2025 and February 2026. Transects of approximately 1 km × 5 m were established in representative habitats. Surveys were conducted during peak butterfly activity periods (08:00–11:30 hrs.) under favourable weather conditions. Butterflies were photographed and identified using standard taxonomic guides. Species richness and habitat-wise occurrence were analyzed from observational data.

### Results

A total of 89 butterfly species representing six families were documented across the varied habitats of Nagaon District during the study period (March 2025–February 2026) (Table - 2). The families recorded included *Nymphalidae*, *Lycaenidae*, *Hesperiidae*, *Papilionidae*, *Pieridae*, and *Riodinidae*. Of these, *Nymphalidae* was the most dominant, comprising 28 species (31.46%), followed closely by *Lycaenidae* with 27 species (30.33%). *Hesperiidae* contributed 19 species (21.35%), while *Papilionidae* accounted for 7 species (7.86%), *Pieridae* for 6 species (6.74%), and *Riodinidae* for 2 species (2.24%). The predominance of *Nymphalidae* and *Lycaenidae* highlights the heterogeneous habitat structure and rich floral diversity of the study area, which provide favorable conditions for these families. Some of the photographs captured during the study period have been included (Fig. 4).

### Habitat-wise species richness

Butterfly diversity varied considerably among habitats. Forest and riverine woodland habitats (FR) exhibited the highest species richness and abundance. These habitats supported several forest-associated and shade-loving species such as *Troides aeacus*, *Parthenos sylvia*, *Rhinopalpa polynice*, *Lexias cyanipardus*, *Papilio memnon*, *Cyrestis thyodamas*, *Charaxes marmax*, and *Idea leuconoe*. The structurally complex vegetation, availability of larval host plants, moist microclimate, and reduced anthropogenic disturbance likely contributed to higher diversity within these habitats.

Fields and grasslands (FG) represented the second most diverse habitat category and were dominated by open-country butterflies including *Danaus chrysippus*, *Junonia almana*, *Junonia orithya*, *Catopsilia pomona*, *Papilio demoleus*, *Pelopidas mathias*, and *Zizeeria maha*. Tea garden habitats (TG) also supported moderate butterfly richness, particularly generalist nectar-feeding species and grass-associated skippers such as *Bibasis sena*, *Matapa aria*, and *Udaspes folus*.

Wetland and beel ecosystems (WG and FL) contributed significantly to butterfly diversity by supporting moisture-dependent species including *Junonia lemonias*, *Junonia orithya*, *Danaus chrysippus*, and *Troides aeacus*. Seasonal mud-puddling behavior was frequently observed near wetland margins and riverbanks during the pre-monsoon and post-monsoon seasons.

Urban habitats (UR) exhibited comparatively lower species richness and were primarily dominated by adaptable and synanthropic species such as *Euploea core*, *Eurema hecabe*, *Lampides boeticus*, and *Zemeros flegyas*. Reduced vegetation cover and habitat fragmentation likely restricted the occurrence of specialist forest butterflies within urbanized areas.

### Seasonal variation

Seasonal variation in butterfly diversity was clearly evident throughout the study period. Species richness and abundance reached their maximum during the post-monsoon season (October–November), followed by the pre-monsoon season (Table-1). The post-monsoon period was characterized by luxuriant vegetation growth, abundant nectar resources, suitable humidity, and optimal climatic conditions which favored butterfly emergence and activity.

Several species including *Troides aeacus*, *Parthenos sylvia*, *Euploea radamanthus*, *Papilio nephelus*, and *Charaxes kahruba* were predominantly observed during the post-monsoon period. The monsoon season also supported high diversity in moist forest habitats, although heavy rainfall reduced flight activity during continuous rain events.

Winter months recorded comparatively lower species richness due to declining temperature and reduced floral availability. Nevertheless, some widespread and adaptable species such as *Eurema hecabe*, *Danaus chrysippus*, *Junonia lemonias*, and *Ypthima baldus* remained active throughout the year (Fig-03).

### Ecologically significant and indicator species

The occurrence of several forest-dependent butterflies indicated the ecological integrity of remnant forest patches and

riverine habitats within Nagaon District. Species such as *Troides aeacus*, *Parthenos sylvia*, *Rhinopalpa polynice*, *Lexias cyanipardus*, and *Cyrestis thyodamas* are generally associated with relatively undisturbed forest ecosystems and indicate the presence of suitable host plant diversity.

The presence of *Idea leuconoe*, *Euploea radamanthus*, and *Parantica aglea* in riverine woodlands and wetland-associated forests highlighted the ecological importance of floodplain vegetation. Similarly, the occurrence of multiple skipper species (*Hesperiidae*) suggested the availability of grasses, bamboos, palms, and monocot host plants in tea gardens and semi-natural habitats.

### Family composition

*Nymphalidae* emerged as the dominant family both in terms of species richness and field encounters. This dominance may be attributed to their broad ecological adaptability, wide host plant spectrum, and strong dispersal ability. *Lycaenidae* also showed high diversity, particularly in semi-open habitats and forest edges where larval ant associations and flowering shrubs were abundant.

*Hesperiidae* exhibited substantial diversity in grasslands, tea gardens, and moist forest habitats, though their cryptic behavior and rapid flight may have resulted in underestimation during surveys. *Papilionidae*, despite lower species richness, included several ecologically important and visually conspicuous species such as *Papilio memnon*, *Papilio polytes*, *Troides aeacus*, and *Lamproptera curius*. *Riodinidae* was represented by only two species, namely *Dodona durga* and *Zemeros flegyas*, indicating comparatively lower abundance of this family within the surveyed habitats (Fig-02).

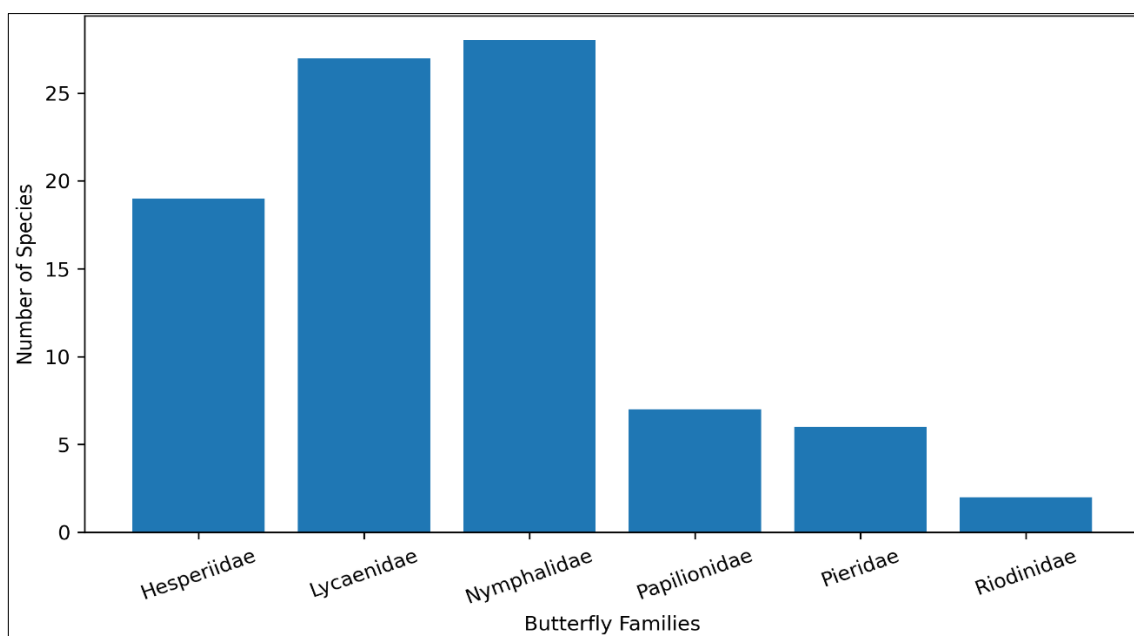


Fig 2: Family-wise butterfly composition recorded during the survey

Table 1: Seasonal richness across sites

Site	Winter	Pre-monsoon	Monsoon	Post-monsoon
Chapanala	45	50	53	63
Laokhowa WS	40	50	58	65
Burhachapori WS	38	48	55	60
Deobali Jalah	25	30	35	40
Silghat	30	35	40	45

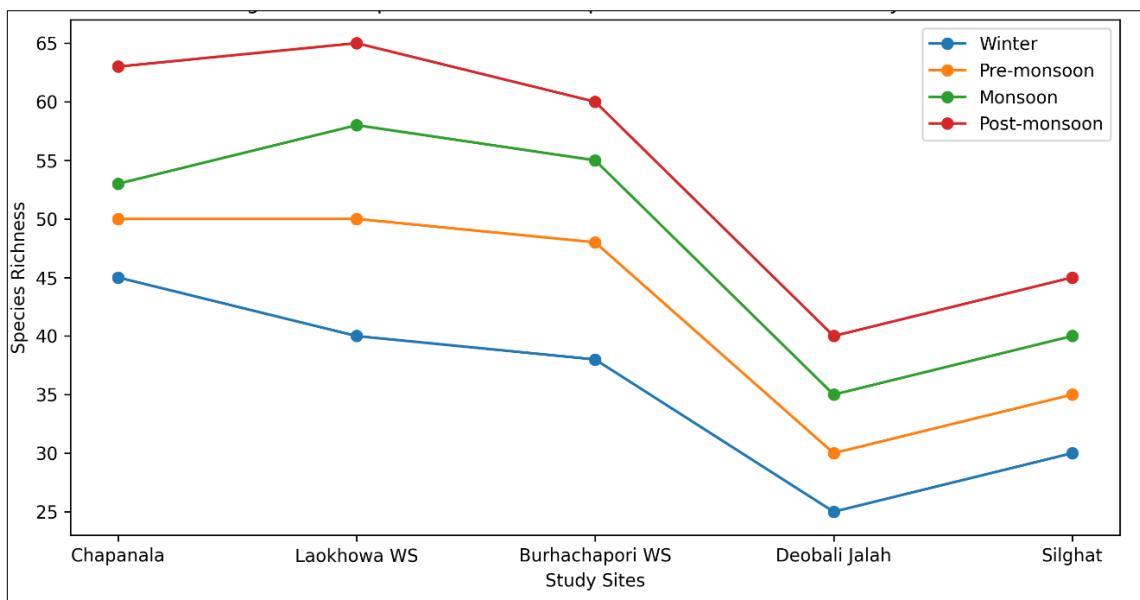


Fig 3: Comparative seasonal species richness recorded from five study sites across four seasons

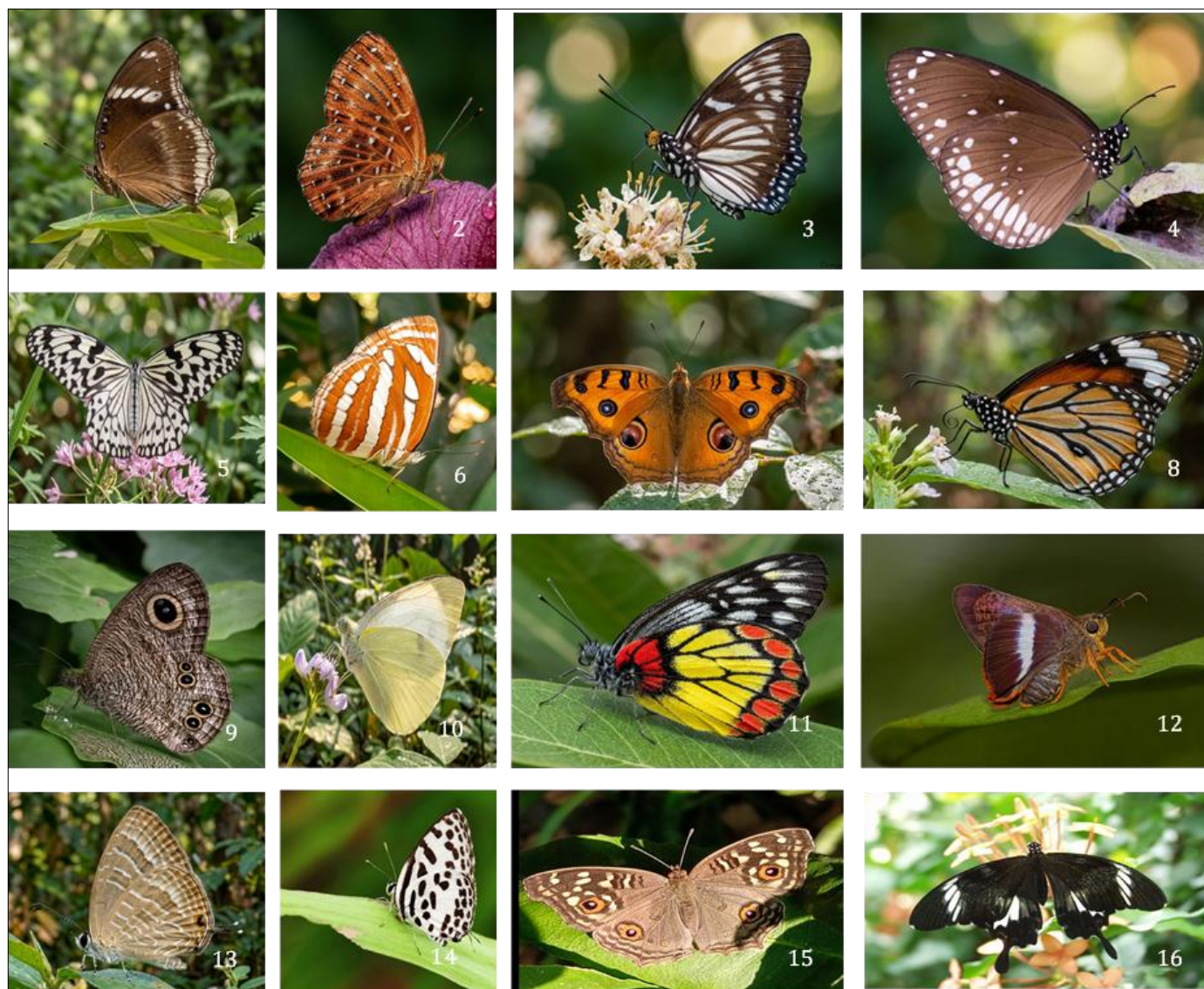


Fig 4: Representative butterfly species recorded during the study: 1. Great Eggfly (*Hypolimnys bolina*) 2. Punchinello (*Zemeros flegyas*) 3. Painted courtesan (*Euripus consimilis*) 4. Common crow (*Euploea core*) 5. Paper Kite (*Idea leuconoe*) 6. Common sailor (*Neptis hylas*) 7. Peacock pansy (*Junonia almana*) winter season form Chapanala 8. Common tiger (*Danaus genutia*) male underside 9. Common five-ring (*Ypthima baldus*) 10. Common Albatross (*Appias albina*) 11. Redbase Jezebel (*Delias pasitioe*) 12. Orange-tailed Awl (*Bibasis sena*) 13. Common Cerulean (*Jamides celeno*) 14. Common Pierrot (*Castalius rosimon*) 15. Lemon Pansy (*Junonia lemonias*) 16. Common Mormon (*Papilio polytes*)

The following checklist represents the provisional butterfly fauna recorded from various habitats of Nagaon District, Assam, including wetlands, wildlife sanctuaries, tea gardens,

riverine forests, and urban wetlands. Species are arranged family-wise with habitat and seasonal occurrence details.

### Family: Hesperiiidae

Sl. No.	Scientific Name	Common Name	Habitat	Season
1	<i>Ancistroides nigrata</i>	Chocolate Demon	FG, TG	W, P, M, A
2	<i>Badamia exclamationis</i>	Brown Awl	FR, FG	W, P, A
3	<i>Baoris farri</i>	Paintbrush Swift	FG, TG	W, P, M, A
4	<i>Bibasis sena</i>	Orange-tailed Awl	FG, TG	P, M, A
5	<i>Burara gomata</i>	Pale Green Awlet	FR	M, A
6	<i>Burara oedipodea</i>	Branded Orange Awlet	FR	M, A
7	<i>Capilia pieridoides</i>	White Dawnfly	FR	P, M
8	<i>Celaenorrhinus aurivittata</i>	Dark-yellow Banded Flat	FR	W, P, M, A
9	<i>Choaspes xanthopogon</i>	Similar Awlking	FR	M, A
10	<i>Gerosis phisara</i>	Dusky Yellow-breast Flat	FR, TG	W, P, M, A
11	<i>Halpe homolea</i>	Indian Ace	FR	W, P, M, A
12	<i>Hasora badra</i>	Common Awl	FR, TG	P, M, A
13	<i>Iton semamora</i>	Common Wight	FG, TG	M, A
14	<i>Matapa aria</i>	Common Redeye	TG, FR	W, P, M, A
15	<i>Notocrypta curvifasciata</i>	Restricted Demon	FR	W, P, M, A
16	<i>Pelopidas mathias</i>	Small Branded Swift	FG, TG	W, P, M, A
17	<i>Scobura cephalia</i>	Forest Bob	FR, TG	W, P, M, A
18	<i>Tagiades litigiosa</i>	Water Snow Flat	WG, FR	W, P, M, A
19	<i>Udaspes folus</i>	Grass Demon	FG, TG	W, P, M, A

### Family: Lycaenidae

20	<i>Acytolepis puspa</i>	Common Hedge Blue	FR, FG	W, P, M, A
21	<i>Anthene emolus</i>	Common Ciliate Blue	FR, FG	W, P, M, A
22	<i>Arhopala centaurus</i>	Centaur Oakblue	FR	P, M, A
23	<i>Artipe eryx</i>	Green Flash	FR	P, M, A
24	<i>Caleta elna</i>	Elbowed Pierrot	FR, FG	W, P, M
25	<i>Castalius rosimon</i>	Common Pierrot	FR, FG	P, M
26	<i>Catapaecilma major</i>	Common Tinsel	FR	P, A
27	<i>Cheritra freja</i>	Common Imperial	FR	P, A
28	<i>Dacalana cotys</i>	White-banded Royal	FR	P, A
29	<i>Deudorix epijarbas</i>	Cornelian	FR, FG	P, A
30	<i>Discolampa ethion</i>	Banded Blue Pierrot	FR	W, P
31	<i>Heliophorus epicles</i>	Purple Sapphire	FR	W, P
32	<i>Hypolycaena erylus</i>	Common Tit	FR	W, P, M, A
33	<i>Jamides alecto</i>	Metallic Cerulean	FR, FG	W, P, M, A
34	<i>Jamides bochus</i>	Dark Cerulean	FR	P, A
35	<i>Jamides celeno</i>	Common Cerulean	FR, FG	W, P, A
36	<i>Lampides boeticus</i>	Pea Blue	FG, UR	W, P, M, A
37	<i>Leptotes plinius</i>	Plumbago Blue	UR, FG P,	M, A
38	<i>Megisba malaya</i>	Malayan	FR, FG	W, P, M, A
39	<i>Nacaduba hermus</i>	Pale Four-lineblue	FR	W, P
40	<i>Nacaduba kurava</i>	Transparent Six-lineblue	FR	W, P
41	<i>Poritia hewitsoni</i>	Common Gem	FR	P, M
42	<i>Prosotas nora</i>	Common Lineblue	FG, FR	W, P, M, A
43	<i>Rapala manea</i>	Slate Flash	FR	P, A
44	<i>Remelana jangala</i>	Chocolate Royal	FR	P, A
45	<i>Spindasis vulcanus</i>	Common Jewel	FR, FG	P, M, A
46	<i>Zizeeria maha</i>	Pale Grass Blue	FG, UR	W, P, M, A

**Family: Nymphalidae**

47	<i>Acraea violae</i>	Tawny Coster	FG	W, P, A
48	<i>Appias albina</i>	Common Albatross	FG, FR	M, A
49	<i>Athyma ranga</i>	Black Vein Sergeant	FR	P, A
50	<i>Charaxes kahrubia</i>	Variiegated Raja	FR	P, A
51	<i>Charaxes marmax</i>	Yellow Raja	FR	P, A
52	<i>Cyrestis thyodamas</i>	Common Map	FR	P, A
53	<i>Danaus chrysippus</i>	Plain Tiger	FG, FL	W, P, M, A
54	<i>Danaus genutia</i>	Striped Tiger	FG, FR	P, A
55	<i>Euripus consimilis</i>	Painted Courtesan	UR	M, A
56	<i>Euripus nyctelius</i>	Sylhet Courtesan	FR	P, A
57	<i>Euploea core</i>	Common Crow	UR	M, A
58	<i>Euploea mulciber</i>	Striped Blue Crow	FR	P, A
59	<i>Euploea radamanthus</i>	Magpie Crow	FR	P, A
60	<i>Graphium agamemnon</i>	Tailed Jay	FR	P, A
61	<i>Hebomoia glaucippe</i>	Great Orange Tip	FR	M, A
62	<i>Hypolimnas bolina</i>	Great Eggfly	FR	P, A
63	<i>Idea leuconoe</i>	Paper Kite	FR	M, A
64	<i>Junonia almana</i>	Peacock Pansy	FG	W, P, A
65	<i>Junonia lemonias</i>	Lemon Pansy	FG, WG	W, P, M, A
66	<i>Junonia orithya</i>	Blue Pansy	FG, WG	W, P, M, A
67	<i>Lexias cyanipardus</i>	Great Archduke	FR	P, A
68	<i>Libythea celtis</i>	Common Beak	FG	W, P, A
69	<i>Neptis hylas</i>	Common Sailer	UR	M, A
70	<i>Neptis jumbah</i>	Chestnut-streaked Sailer	FR	P, A
71	<i>Parantica aglea</i>	Glassy Tiger	FR	P, A
72	<i>Parthenos sylvia</i>	Clipper	FR	P, A
73	<i>Rhinopalpa polynice</i>	Wizard	FR	P, A
74	<i>Ypthima baldus</i>	Common Five-ring	FG, TG	W, P, M, A

**Family: Papilionidae**

75	<i>Graphium agamemnon</i>	Tailed Jay	FR	P, A
76	<i>Lamproptera curius</i>	White Dragon Tail	FR	P, A
77	<i>Papilio demoleus</i>	Lime Butterfly	FG, TG	W, P, M, A
78	<i>Papilio memnon</i>	Great Mormon	FR	P, A
79	<i>Papilio nephelus</i>	Yellow Helen	FR	P, A
80	<i>Papilio polytes</i>	Common Mormon	FR, FG, TG	W, P, A
81	<i>Troides aeacus</i>	Golden Birdwing	FR, FL	P, M, A

**Family: Pieridae**

82	<i>Appias lyncida</i>	Chocolate Albatross	FR	P, A
83	<i>Catopsilia pomona</i>	Lemon Emigrant	FG, TG	W, P, A
84	<i>Catopsilia pyranthe</i>	Mottled Emigrant	FG	P, M, A
85	<i>Delias pasithoe</i>	Redbase Jezebel	FR	M, A
86	<i>Eurema hecabe</i>	Common Grass Yellow	FG, UR	W, P, M, A
87	<i>Gandaca harina</i>	Tree Yellow	FG, FR	W, P, M, A

**Family: Riodinidae**

88	<i>Dodona durga</i>	Common Punch	FR	P, A
89	<i>Zemeros flegyas</i>	Punchinello	UR	M, A

### Habitat codes

FG = Fields and Grasslands

FR = Forest and Riverine Woodland

FL = Floodplain Wetland

WG = Wetland/Beel

TG = Tea Garden

UR = Urban Habitat

### Season codes

W = Winter (December–February)

P = Pre-monsoon (March–May)

M = Monsoon (June–September)

A = Post-monsoon (October–November)

### Discussion

The present study provides an important baseline assessment of butterfly diversity in Nagaon District, Assam. A total of 89 species belonging to six families were recorded from diverse habitats including forests, wetlands, grasslands, tea gardens, and riverine ecosystems. The high species richness reflects the heterogeneous landscape and ecological significance of the central Brahmaputra floodplain region.

*Nymphalidae* was the dominant family, which agrees with earlier studies conducted in Assam and Northeast India (Haribal M., 1992; Gogoi, M.J., 2013) [6, 5]. The abundance of genera such as *Danaus*, *Euploea*, and *Parantica* indicates the availability of suitable larval host plants and nectar resources in semi-natural habitats. The considerable representation of *Lycaenidae* and *Hesperiidae* further suggests the presence of diverse microhabitats and healthy understory vegetation.

Forest and riverine woodland habitats supported the highest butterfly diversity due to favourable microclimatic conditions, rich floral composition, and relatively lower disturbance. Species such as *Rhinopalpa polynice*, *Parthenos sylvia*, *Cyrestis thyodamas*, and *Troides aeacus* are generally associated with stable forest ecosystems and indicate good habitat quality. Wetland ecosystems and Beels also played an important ecological role by supporting mud-puddling activity and moisture-dependent species. Seasonal variation was clearly evident, with maximum butterfly richness observed during the post-monsoon period. Similar seasonal trends have been reported from other parts of Northeast India (Kunte K., 2000; Kehimkar I., 2016) [11, 9]. Increased humidity, fresh vegetation growth, and greater nectar availability during the post-monsoon season likely favor butterfly emergence and breeding. Tea garden landscapes also supported moderate butterfly diversity, particularly generalist and grass-associated species such as *Papilio demoleus*, *Pelopidas mathias*, and *Udaspes folus*. Tea estates with shade trees and adjoining secondary vegetation may therefore function as supplementary habitats for butterflies.

Despite the rich diversity observed, habitat degradation, wetland reclamation, pesticide use, deforestation, and urban expansion pose significant threats to butterfly populations in the district. The present study therefore provides valuable baseline data for future ecological monitoring and conservation planning in central Assam.

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### Conclusion

The present study revealed that Nagaon District supports a rich and ecologically significant butterfly fauna associated with its diverse landscapes, including forests, riverine woodlands, wetlands, grasslands, tea gardens, and agricultural habitats. A total of 89 species belonging to six families were recorded during the study period, highlighting the importance of the central Brahmaputra floodplain as a suitable habitat for both widespread and forest-associated butterfly species. The dominance of *Nymphalidae* and the occurrence of ecologically sensitive species such as *Troides aeacus*, *Parthenos sylvia*, *Rhinopalpa polynice*, and *Lamproptera curius* indicate the presence of relatively stable and biologically productive ecosystems within the district.

Seasonal variation in butterfly diversity was pronounced, with maximum richness observed during the post-monsoon period due to favorable climatic conditions, increased vegetation growth, and greater nectar availability. Forest and riverine habitats supported the highest diversity, emphasizing their role as important refuges and dispersal corridors for butterfly populations. Wetlands and beels also contributed substantially by supporting moisture-dependent species and mud-puddling activities.

The study further demonstrates that semi-natural habitats such as tea gardens and village woodlands can support moderate butterfly diversity when associated with shade vegetation and remnant natural habitats. However, increasing anthropogenic pressures including habitat fragmentation, wetland degradation, pesticide use, deforestation, and urban expansion may negatively affect butterfly populations and ecological stability in the region.

The present investigation provides valuable baseline information for future biodiversity assessments, ecological monitoring, and conservation planning in central Assam. Long-term monitoring, habitat restoration, protection of wetlands and riverine forests, and awareness-based conservation strategies will be essential for sustaining butterfly diversity and maintaining ecological balance in the Brahmaputra valley landscape.

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