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Cover: Nilgiri Large Burrowing Spider *Haploclastus nilgirinus*. Acrylic on canvas. © Aakanksha Komanduri.

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ARTICLE

Diversity and habitat preferences of butterflies (Insecta: Lepidoptera) in Dzongu, Mangan, Sikkim, India

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Abstract: The butterfly diversity of the Dzongu region of Mangan District, Sikkim was assessed between 2016 and 2024, revealing the presence of 420 species from 187 genera and six families. Nymphalidae emerged as the dominant family with 165 species across 68 genera, followed by the Lycaenidae with 92 species from 51 genera, Hesperiidae with 84 species from 44 genera, Papilionidae with 38 species from eight genera, Pieridae with 32 species from 13 genera, and Riodinidae with nine species from three genera. A total 118 butterfly species that were protected under the Indian Wildlife (Protection) Amendment Act, 2022, with the majority falling under Schedule II. Very rare documents included *Papilio krishna*, *Teinopalpus imperialis*, *Meandrusa lachinus*, *Stichophthalma camadeva*, *Euaspa pavo*, *Ionolyce helicon*, *Dodona adonira*, and *Koruthaialos butleri*, the state butterfly of Sikkim *Bassarona durga* and the newly discovered species, *Zographetus dzonguensis*. A total of 194 butterfly species exclusive to the northeastern region of India were documented. It was found that the sub-tropical hill forest supported the highest butterfly diversity with 395 species recorded, and the sub-alpine forest supported the lowest diversity with 13 species. The unique geographical features of Dzongu support a wide variety of butterfly species and the presence of more than half the species in Sikkim underscores the importance of prioritizing conservation efforts in this unique valley.

Keywords: Butterfly species, comprehensive checklist, field survey, Hesperiidae, Lycaenidae, northeastern India, northern Sikkim, Nymphalidae, Papilionidae, Pieridae, richness, Riodinidae.

Nepali: सिक्किमको मङ्गन जिल्लाको जोङ्गु क्षेत्रको पुतली विविधताको मूल्याङ्कन 2016 र 2024 को बीचमा गरिएको थियो, जसमा 187 वंश र छ परिवारका 420 प्रजातिहरूको उपस्थिति पता लागेको थियो। निम्फालिडे 68 वंशमा 165 प्रजातिहरू सहित प्रमुख परिवारको रूपमा देखा परेका थिए, त्यसपछि 51 वंशबाट 92 प्रजातिहरू सहित लाइकेनिडे, 44 वंशबाट 84 प्रजातिहरू सहित हेस्पेरिडे, आठ वंशबाट 38 प्रजातिहरू सहित प्यापिलियोनिडे, 13 वंशबाट 32 प्रजातिहरू सहित पिएरिडे, र तीन वंशबाट नौ प्रजातिहरू सहित रियोडिनिडे रहेका थिए। भारतीय वन्यजन्तु (संरक्षण) संशोधन एक्ट, 2022 अन्तर्गत संरक्षित कुल 118 पुतली प्रजातिहरू, जसमध्ये धेरैजसो अनुसूची ॥ अन्तर्गत पर्दछन्। धेरै दुर्लभ दस्तावेजहरूमा *Papilio krishna, Teinopalpus imperialis, Meandrusa lachinus, Stichophthalma camadeva, Euaspa pavo, Ionolyce helicon, Dodona adonira, Koruthaialos butleri* र सिक्किमको राज्य पुतली *Bassarona durga* र नयाँ पत्ता लागेको प्रजाति, *Zographetus dzonguensis* समावेश थिए। भारतको उत्तरपूर्वी क्षेत्रमा मात्र रहेका 194 पुतली प्रजातिहरूको अभिलेखीकरण गरिएको थियो। उप-उष्णकटिबंधीय पहाडी वनले 395 प्रजातिहरू रेकर्ड गरिएको उच्चतम पुतली विविधतालाई समर्थन गरेको पाइयो, र उप-अल्पाइन वनले 13 प्रजातिहरू रेकर्ड गरिएको सबैभन्दा कम विविधतालाई समर्थन गरेको पाइयो। जोङ्गुको अद्वितीय भौगोलिक विशेषताहरूले पुतली प्रजातिहरूको विस्तृत विविधतालाई समर्थन गर्दछ र सिक्किममा आधा भन्दा बढी प्रजातिहरूको उपस्थितिले यस अद्वितीय उपत्यकामा संरक्षण प्रयासहरूलाई प्राथमिकता दिनुको महत्त्वलाई जोड दिन्छ।

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Author contributions: SWL—conceptualization, data collection, fieldwork, paper review; MKT—conceptualization, data collection, paper review, data curation, formal analysis, methodology, writing—original draft and editing.

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INTRODUCTION

India is recognized as one of the 17 mega biodiversity countries globally, with northeastern India as a significant biodiversity hotspot. This region is further categorized into the northeastern hills, the eastern Himalaya, and the Brahmaputra Valley (Gogoi 2015). Sikkim, a small Himalayan State in northeastern India with a geographical area of 7,096 km², boasts an incredibly rich diversity of flora and fauna. It's unique geographical location, varied topography, fertile soil, ample rainfall, and numerous perennial streams make (Idrisi et al. 2010). Sikkim is considered one of the most biodiverse zones.

It is estimated that more than 40% of insect species are declining at a rate eight times faster than that of mammals, birds, and reptiles (Sánchez-Bayo & Wyckhuys 2019). The primary factors contributing to this decline include habitat loss, urbanization, pollution, pathogens or invasive species, and global climate change. Butterflies (Order: Lepidoptera), in particular, are regarded as excellent bio-indicators of environmental health due to their short life cycle and varied habitat needs and food preferences for activities such as mating, breeding, and nectaring. Their well-documented taxonomy, geographic distribution, and status make butterflies ideal subjects for biodiversity studies.

Globally, there are over 20,000 butterfly species (Happner 1998; Koneri et al. 2020), of which 1,502 species are found in India (Udaya et al. 2019). Remarkably, the state of Sikkim alone is home to approximately 700 of butterfly species (Haribal 1992; ENVIS 2015). Scant studies on butterfly diversity in northeastern India, the region's butterfly populations remain incompletely documented. Literature reveals that new species and previously unrecorded butterfly sightings are regularly being discovered and added to the list of butterflies in this northeastern region of India. Previous studies on the Lepidoptera fauna of the Sikkim Range in the eastern Himalaya date back to de Niceville's work from 1881–1885. In 1884, de Niceville provided an annotated overview of the state's fauna in a Gazetteer. Subsequent studies were carried out by Elwes (1882, 1888) and Dudgeon (1898, 1900–1901). Elwes (1888) compiled a catalogue of Sikkim's Lepidoptera, which was enhanced with additions, corrections, and distribution information by Otto Moeller (Maulik 2003). Haribal (1992) focused their work on lepidopteran species, especially butterflies, within the state. Gupta (2003) documented 155 species and subspecies of Nymphalid butterflies from Sikkim. Majumdar (2003) documented 227 butterfly species from the Pieridae and Hesperiidae families. The Hesperiidae family comprises the majority with 176 species, while the Pieridae family includes the remaining 51 species. Lepcha et al. (2021) recorded new distributional record for the *E. pavo* from Sikkim. Again, Lepcha et al. (2023) reported new distributional record of *Euaspa milionia* from the state in 2023. Lepcha (2023) published a guidebook on butterflies of Dzongu, which includes 368 species from the region in 2023. The primary aim of this paper is to compile a comprehensive checklist of butterflies in the Dzongu region, Mangan District of northern Sikkim, India.

MATERIALS AND METHODS

Study Area

The study was conducted to document the butterfly diversity in Dzongu, located in the Mangan District of northern Sikkim, India. Dzongu, roughly triangular in shape, is bounded by the Teesta River to the southeastern and the Talung River to the northeastern side. To the western side lies the southern part of the Himadri, or greater Himalayan ranges, where Mt. Kanchenjunga, the world's third-highest peak (at 8,598 m) is situated. Dzongu spans between 27.466–27.633 °N and 88.383–88.633 °E (Figure 1), with elevations ranging 700–6,000 m. The area covers a hilly terrain of 78 km² with dense forests (Purkayastha 2013).

The area boasts a unique and picturesque landscape of snow-clad mountains surrounded by steep, narrow valleys and gorges. The dense forest cover brings showers almost throughout the year. Bordering the Kanchenjunga Biosphere Reserve, Dzongu is also home to some of the ancient Buddhist monasteries and temples, adding cultural richness to its natural beauty. The geographical location of Dzongu isolates it from the rest of Sikkim. The area can be divided into three climatic zones: subtropical, temperate, and alpine, each rich in biodiversity.

Methods

The survey was designed with the primary objective of compiling a comprehensive checklist of butterflies from the Dzongu region in the Mangan District of northern Sikkim employing a range of established methodologies including the line transect method (Pollard 1977) and visual encounter survey (Heyer et al. 1994) to document butterfly species. These techniques ensured thorough habitat coverage.

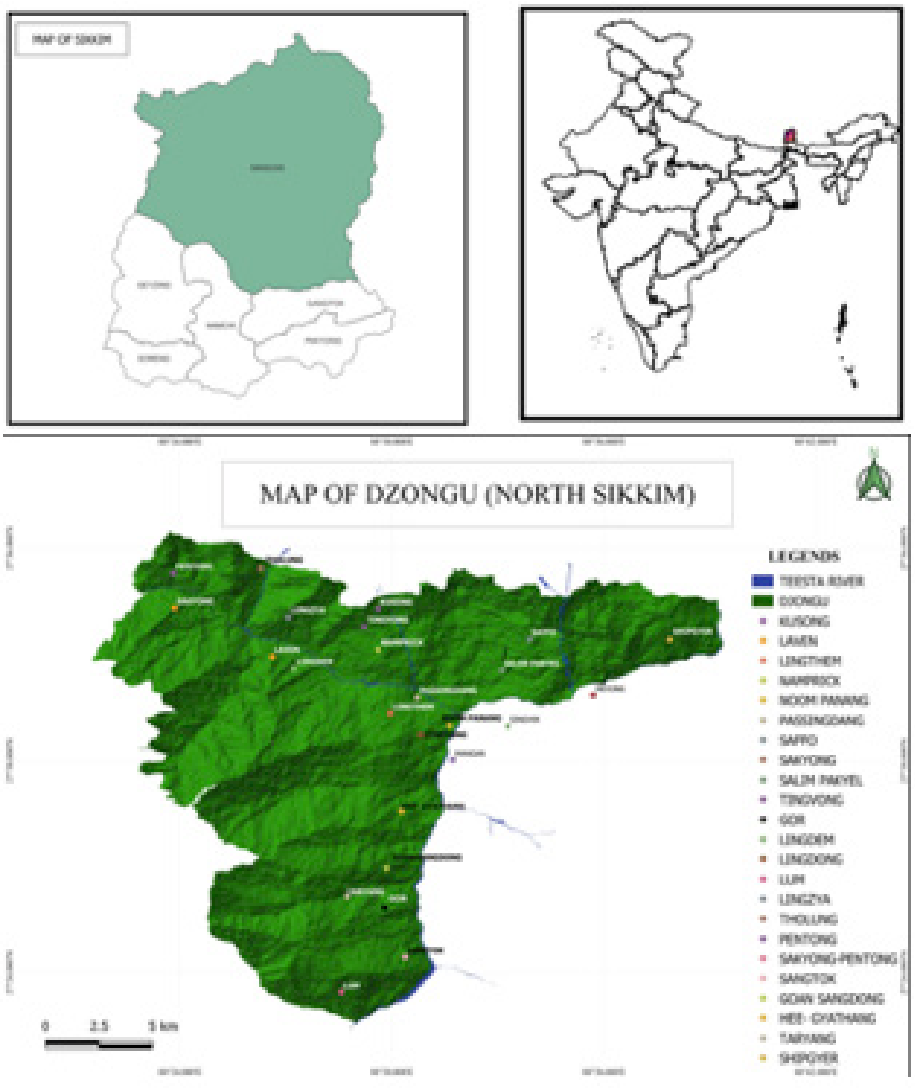


Figure 1. Map showing the study area in Dzongu, northern Sikkim, India.

Study design

The field survey was conducted over an extensive period of eight years, from 2016 to 2024. The year was divided into four distinct seasons: summer, monsoon, post-monsoon, and winter. Observations were meticulously carried out under favorable weather conditions, ensuring the absence of rain or strong winds. Data collection spanned eight hours each day, from 0600 to 1100 h and from 1400 to 1700 h. Field surveys were conducted five times during each season during the study period. As observation hours were allocated equally across all sampling sites, the total observation hrs per season were approximately consistent. To facilitate efficient data collection, the study area was divided into four habitat zones: tropical semi-evergreen forest (TSF), sub-tropical hill forest (STF), wet temperate forests (WTF) and sub-alpine forest (SAF) (Image 7). These zones were categorized based on the dominant vegetation types, and altitudine ranges as per Champion & Seth (1968).

Data collection and identification

During the fieldwork, data on all encountered butterflies were meticulously collected. Observations were conducted randomly along foot trails, stream and riverbeds, and grasslands bordering these areas. Photographic evidence was captured using a Canon D80 Camera. The survey was conducted across all forest habitats within the study area, spanning a total transect length of 35–40 km. Each transect path was monitored for butterfly records with a width of approximately 150 m on either side. Ten search paths were strategically

chosen across different habitat types: three paths in tropical semi-evergreen forest (TSF) and sub-tropical hill forest (STF), and two paths in both wet temperate forest (WTF) and sub-alpine forest (SAF) habitats (Image 7). Adhering to conservation principles, no specimens were collected during the survey. A map of the study area (Figure 1) was created using Q-GIS software version 3.18, and data analysis was performed using Microsoft Office Excel 2007.

Species indentification was based on visual examination and color photographs, utilizing published guides for butterflies. Identification keys from Evans (1932), the photographic guide by Haribal (1992) and Kehimkar (2016), and the Butterflies of India website (https://www.ifoundbutterflies.org/) were employed.

RESULTS

The study identified a total of 420 butterfly species from 187 genera under 25 subfamilies and six families in Dzongu Valley, Mangan District of northern Sikkim (Table 1,2). Nymphalidae was the dominant family, represented by 68 genera and 165 species, followed by Lycaenidae with 51 genera and 92 species, Hesperiidae with 44 genera and 84 species, Papilionidae with eight genera and 38 species, Pieridae with 13 genera and 32 species, and Riodinidae with three genera and nine species (Table 1; Image 1–6). In total, 118 butterfly species are recognized as schedule species under the Wildlife (Protection) Amendment Act, 2022 (Anonymous 2022). Of these, 93 species are listed under Schedule II, while 25 species are included in Schedule I. The study also identified 194 species of endemic butterflies that are restricted to the northeastern region of India.

Diversity of butterflies in the study area

Nymphalidae showed the maximum species richness, comprising 39% with 165 species, followed by Lycaenidae (22% with 92 species), Hesperiidae (20% with 84 species), Papilionidae (9% with 38 species), Pieridae (8% with 32 species) and Riodinidae (2% with 9 species) (Figure 2). It was concluded that the Dzongu Valley is very rich in butterfly diversity.

Habitat types used by butterflies

Throughout the study, butterflies were observed across all four habitat types. It was found that the sub-tropical hill forest (STF) supported the highest diversity, with 395 species recorded. This was followed by TSF with 368 species, WTF with 168 species, and SAF with 13 species. Notably, SAF was not utilized by the Papilionidae and Hesperiidae families, while the other butterfly families were present across all four habitat types (Figure 3).

Comparative analysis of butterfly diversity of Sikkim and Dzongu

The study reveals a significant difference in species richness of Dzongu in comparison with Sikkim State. Dzongu, a small valley nestled in the northern part of Sikkim, is a remarkable region known for its rich biodiversity. The Dzongu Valley is home to an impressive total of 420 butterfly species, which comprises 60.95% of the entire butterfly species found in Sikkim. This high percentage highlights Dzongu as a significant biodiversity hotspot within the state, particularly in terms of Lepidoptera diversity.

The butterflies of Dzongu make up 60.95% of the total butterfly species in Sikkim.

Table 1. Family-wise composition of butterflies exhibiting the total number of genera and species in the study area.

	Family	Subfamily	Genera	Species
01	Papilionidae	01	08	38
02	Pieridae	02	13	32
03	Nymphalidae	12	68	165
04	Lycaenidae	06	51	92
05	Riodinidae	01	03	09
06	Hesperiidae	03	44	84
Total		25	187	420

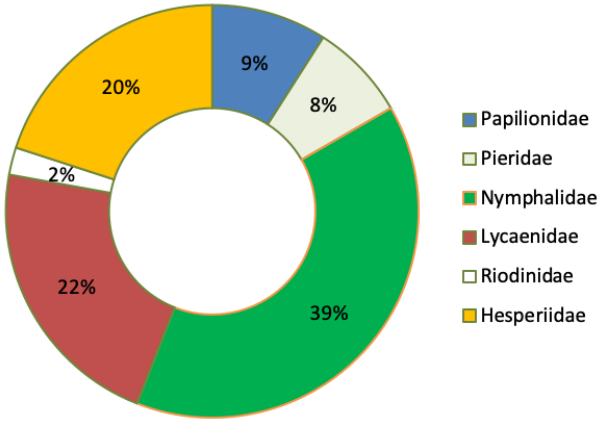


Figure 2. Family-wise distribution of butterflies from Dzongu, northern Sikkim, India.

Notes on selected species

1. *Papilio krishna* (Moore, 1858)
This butterfly is rare in Dzongu, observed in locations such as Ring Uung Kyoung, Tingvong, Laven, Passingdang, and Namprickdang. Occasionally, it was seen actively puddling with other butterflies.

2. *Teinopalpus imperialis* (Hope, 1843)
Two individuals were seen at Lingthem near Na-ar Uung Kyong and Gong-Lee in 2024. Both the individuals were seen during mud-puddling.

3. *Graphium paphus* (de Nicéville, 1886)
Graphium paphus, known as the Spectacle Swordtail, were seen in Ring Uung Kyoung, along the Rungyoung River belt, and in the Talong Chu River belt area in Dzongu.

4. *Meandrusa lachinus* (Fruhstorfer, 1902)
This species was observed in Lingthem and Laven, particularly in puddling areas near small river streams.

5. *Dercas lycorias* (Doubleday, 1842)
Commonly seen at Lingza waterfalls. Around 20–24 individuals were observed engaging in puddling behavior.

6. *Helcyra hemina* (Hewitson, 1864)
This butterfly was spotted first near Passingdang, mud puddling on roadside rocks. This species was noted for its high-speed flight. Another individual was seen again the following year in the same area, perched above tree leaves along the roadside.

7. *Calinaga gautama* (Moore, 1902)
First spotted at an elevation of 1,400 m in Panang Village near a villager's house. It was later observed at the Namprickdang riverside on wet stone puddling and again at Ring Uung Kyoung along the river belt with other butterflies.

8. *Bassarona durga* (Moore, 1858)
It is common in Dzongu, observed from lower to upper regions between June and October annually. It is often seen actively flying along roadsides, riverbelts, and in and around human habitats. This butterfly has been declared as the state butterfly of Sikkim on 5 June 2022, during World Environment Day.

9. *Euthalia franciae* (Gray, 1846)
This species has been recorded multiple times in Dzongu, particularly in areas such as Hee-Gyathang, Noam Panang, Passingdang, and Lingza. This species is especially active during the guava fruit season.

10. *Euthalia iva* (Moore, 1858)
Seen at Ring Uung Kyoung along the river belt, flying above short trees. It was also recorded at the Laven River belt and Passingdang along the roadside.

11. *Neurosigma siva* (Westwood, 1850)
Exclusively observed in upper Dzongu, particularly at Lingza Village and waterfall areas, as well as in the Bay area at elevations up to 2,200 m.

12. *Neptis manasa* (Moore, 1858)
Eight to nine individuals were observed in upper Dzongu, particularly between Mantam and Laven in roadside areas.

13. *Neptis nycteus* (de Nicéville, 1890)
Seen at Panang Village in human habitation. The butterfly was flying on top of trees.

14. *Stichophthalma camadeva* (Westwood, 1848)
The northern Jungle queen is frequently observed in the Noam Panang area, along roadsides in lower Dzongu, and even in upper Dzongu, particularly in bamboo forests. The number of sightings often exceeds 30–40 individuals annually.

15. *Lethe ramadeva* (de Nicéville, 1887)
Recorded at Lingthem, Ruklu, and Laven along roadside areas. Often seen basking.

16. *Lethe scanda* (Moore, 1858)
Three individuals were observed at distances from each other flying actively in Safo along the roadside area at an altitude above 1,925 m.

17. *Lethe gulnihal* (de Nicéville, 1887)
Lethe gulnihal was recorded for the first time in August 2024 from Saffo Village, Dzongu, at the elevation of 1,996 m. A total of five individuals were observed.

18. *Lethe serbonis* (Hewitson, 1876)
Three individuals were seen in the dense forest of the Talung area at elevations above 2,400 m.

19. *Lethe visrava* (Moore, 1866)
Commonly, seen in bamboo forest and forests of Noam Panang, Lingthem, Lingdem, and Laven.

20. *Neorina hilda* (Westwood, 1851)
Four individuals were observed in the dense forest of the Talung at elevations above 2,400 m.

21. *Lethe brisanda* (de Nicéville, 1886)
This butterfly occurred singularly among different areas in the densely forested Talung Valley (WTF).

22. *Iraota timoleon* (Stoll, 1790)
Two individuals were observed at the Passingdang Monastery.

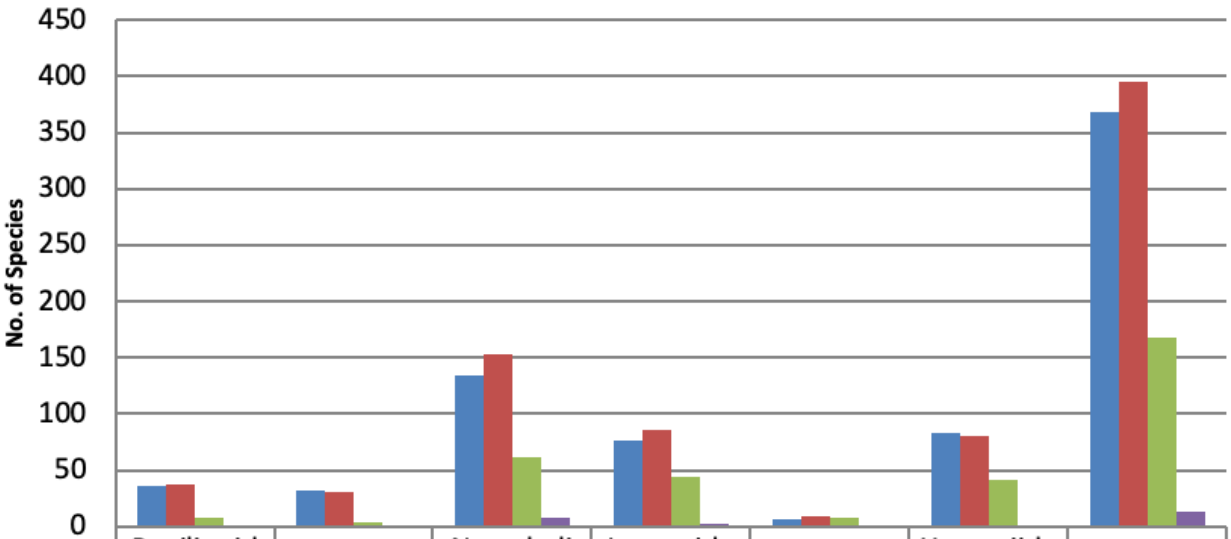
23. *Cigaritis rukma* (de Nicéville, 1889)
This species was observed at Laven, Lingza, Mantam, Passingdang, and Lingthem in open roadside or construction areas, with sightings typically involving multiple individuals.

24. *Cigaritis evansii* (Tytler, 1915)
Seen in Tingvong, Mantam, and Passingdang areas, primarily along open roadsides or in construction areas, often as multiple individuals.

25. *Euaspa milionia* (Hewitson, 1869)
The species was observed at Salim Pakyel, as it flew away high up into the trees.

26. *Dodona egeon* (Westwood, 1851)
This rare butterfly has been observed 15–17 times in Passingdang and Namprickdang, and 5–7 times at Mantam, Tingvong, and Laven, often along the roadside.

27. *Zographetus dzonguensis* Kunte et al. 2021
Zographetus dzonguensis, commonly known as the Chocolate-bordered Flitter, was first recorded in the Namprickdang area of upper Dzongu in 2016, with subsequent sightings in 2019 and 2020 during the months of September and October. In 2016, three individuals were observed; this number increased to



	Papilionidae	Pieridae	Nymphalidae	Lycaenidae	Riodinidae	Hesperiidae	Total
TSF	36	32	134	76	7	83	368
STF	37	30	153	86	9	80	395
WTF	8	4	62	44	8	42	168
SAF	0	1	8	3	1	0	13

Figure 3. Distribution of species among different habitats used by butterflies: TSF—tropical semi-evergreen forest | STF—sub-tropical hill forest | WTF—wet temperate forest | SAF—sub-alpine forest.

Table 2. Annotated list of butterflies recorded in Dzongu, northern Sikkim during the study period.

	Scientific name	Common name	Habitats	W(P)AA, 2022	Endemic to northeastern India
Family: Papilionidae Subfamily: Papilioninae					
1	*Graphium antiphates nebulosus*	Himalayan Five-bar Swordtail	TSF, STF		
2	*Graphium chironides chironides*	Darjeeling Veined Jay	TSF, STF		Endemic
3	*Graphium cloanthus cloanthus*	Himalayan Glassy Bluebottle	TSF, STF	SC II	
4	*Graphium doson axionides*	Himalayan Common Jay	TSF, STF		
5	*Graphium eurous sikkimica*	East Himalayan Six-bar Swordtail	TSF, STF		Endemic
6	*Graphium eurypylus acheron*	Indo-Chinese Great Jay	TSF, STF	SC II	Endemic
7	*Graphium macareus indicus*	East Himalayan Lesser Zebra	TSF, STF		Endemic
8	*Graphium paphus*	(Spectacle) Swordtail	TSF, STF		Endemic
9	*Graphium sarpedon sarpedon*	Oriental Common Bluebottle	TSF, STF	SC II	
10	*Graphium xenocles xenocles*	Great Zebra	TSF, STF		Endemic
11	*Graphium agamemnon agamemnon*	Oriental tailed Jay	TSF, STF		
12	*Papilio clytia*	Common Mime	TSF	SC II	
13	*Papilio agestor agestor*	East Himalayan Tawny Mime	TSF, STF		Endemic
14	*Papilio alcmenor alcmenor*	Khasi Red-breasted Mormon	TSF, STF		
15	*Papilio arcturus arcturus*	East Himalayan Blue Peacock	TSF, STF		Endemic
16	*Papilio bianor ganesa*	East Himalayan Common Peacock	TSF, STF, WTF		Endemic
17	*Papilio bootes janaka*	Himalayan- tailed Redbreast	TSF, STF	SC II	Endemic
18	*Papilio castor polias*	Himalayan Common Raven	TSF, STF		Endemic
19	*Papilio demoleus demoleus*	Northern Lime Butterfly	TSF, STF		
20	*Papilio epycides epycides*	Himalayan Lesser Mime	TSF, STF	SC II	Endemic
21	*Papilio helenus helenus*	Oriental Red Helen	TSF, STF		
22	*Papilio krishna krishna*	Himalayan Krishna Peacock	TSF, STF	SC I	Endemic
23	*Papilio chaon chaon*	Khasi Yellow Helen	TSF, STF		Endemic
24	*Papilio paris paris*	Chinese Paris Peacock	TSF, STF, WTF		
25	*Papilio polytes romulus*	Indian Common Mormon	TSF, STF		
26	*Papilio protenor euprotenor*	Himalayan Spangle	TSF, STF		
27	*Papilio janaka*	Red-banded Mormon	TSF, STF		
28	*Papilio agenor agenor*	Continental Great Mormon	TSF, STF, WTF		Endemic
29	*Meandrusa lachinus lachinus*	Himalayan Brown Gorgon	STF, WTF	SC II	Endemic
30	*Teinopalpus imperialis imperialis*	Himalayan Kaiser-i-Hind	STF	SC I	Endemic
31	*Atrophaneura adioneus*	Lesser Batwing	TSF, STF		
32	*Atrophaneura varuna*	Common Batwing	TSF, STF		
33	*Byasa dasarada dasarada*	East Himalayan Great Windmill	TSF, STF, WTF		Endemic
34	*Byasa latreillei latreillei*	Himalayan Rose Windmill	TSF, STF	SC II	
35	*Byasa polyeuctes polyeuctes*	Common Windmill	TSF, STF, WTF		Endemic
36	*Pachiopta aristolochiae aristolochiae*	Indian Common Rose	TSF, STF		
37	*Troides aeacus aeacus*	Khasi Golden Birdwing	TSF, STF, WTF	SC II	
38	*Troides helena cerberus*	Khasi Common Birdwing	TSF, STF, WTF		
Family: Pieridae Subfamily: Coliadinae					
39	*Catopsilia pomona pomona*	Oriental Lemon Emigrant	TSF, STF		
40	*Catopsilia pyranthe pyranthe*	Oriental Mottled Emigrant	TSF, STF		
41	*Colias fieldii fieldii*	Himalayan Dark Clouded Yellow	TSF, STF, WTF, CTF		

	Scientific name	Common name	Habitats	W(P)AA, 2022	Endemic to northeastern India
42	*Dercas lycorias lycorias*	Sylhet Plain Sulphur	TSF, STF, WTF	SC II	Endemic
43	*Dercas verhuelli doubledayi*	Indo-Chinese tailed Sulphur	TSF, STF, WTF		Endemic
44	*Eurema andersonii jordani*	Sikkim One-spot Grass Yellow	TSF, STF	SC II	
45	*Eurema blanda silhetana*	Sylhat Three-spot Grass Yellow	TSF, STF		
46	*Eurema brightta rubella*	Red-line Small Grass Yellow	TSF		
47	*Eurema hecabe hecabe*	Oriental Common Grass Yellow	TSF, STF		
48	*Eurema laeta laeta*	Indian Spotless Grass Yellow	TSF, STF		
49	*Eurema simulatrix sarinoides*	Changeable Grass Yellow	TSF		Endemic
50	*Gandaca harina assamica*	Assam Tree Yellow	TSF, STF		Endemic
Subfamily: Pierinae					
51	*Hebomoia glaucippe glaucippe*	Oriental Great Orange-tip	TSF, STF		Endemic
52	*Appias albina darada*	Common Albatross	TSF, STF	SC II	
53	*Appias indra indra*	Himalayan Plain Puffin	TSF, STF	SC II	Endemic
54	*Appias lalage lalage*	Himalayan Spot Puffin	TSF, STF		
55	*Appias lyncida eleonora*	Indo-Chinese Chocolate Albotross	TSF, STF	SC II	Endemic
56	*Belenois aurota aurota*	Indian Pioneer	TSF, STF		
57	*Cepora nadina nadina*	Khasi Lesser Gull	TSF, STF	SC II	Endemic
58	*Cepora nerissa nerissa*	Chinese Common Gull	TSF, STF		
59	*Delias acalis pyramus*	Himalayan Redbreast Jezebel	TSF, STF		
60	*Delias agostina agostina*	Sikkim Yellow Jezebel	TSF, STF		Endemic
61	*Delias belladonna ithiela*	Sikkim Hill Jezebel	TSF, STF		
62	*Delias descombesi descombesi*	Red-spot Jezebel	TSF, STF		Endemic
63	*Delias eucharis*	Indian Jezebel	TSF, STF		
64	*Delias hyparete indica*	Indian Painted Jezebel	TSF, STF		Endemic
65	*Delias pasithoe pasithoe*	Chinese Red-base Jezebel	TSF, STF		Endemic
66	*Delias sanaca bhutya*	Eastern Himalayan Pale Jezebel	TSF, STF	SC I	Endemic
67	*Pieris brassicae nepalensis*	Nepalese Large Cabbage White	TSF, STF, WTF		
68	*Pieris canidia indica*	Himalayan Cabbage White	TSF, STF		
69	*Pontia daplidice moorei*	Himalayan Bath White	TSF, STF		
70	*Ixias pyrene*	Yellow Orange-tip	TSF, STF		
Family: Nymphalidae **Subfamily: Danainae**					
71	*Danaus chrysippus chrysippus*	Orental Plain Tiger	TSF, STF		
72	*Danaus genutia genutia*	Oriental Striped Tiger	TSF, STF		
73	*Euploea core core*	Indian Common Crow	TSF, STF		
74	*Euploea mulciber mulciber*	Bengal Striped Blue Crow	TSF, STF		
75	*Parantica aglea melanoides*	Himalayan Glassy Tiger	TSF, STF		
76	*Parantica melaneus plataniston*	Himalayan Chocolate Tiger	TSF, STF		
77	*Parantica pedonga*	Pedong Tiger	TSF, STF		Endemic
78	*Parantica sita sita*	Himalayan Chestnut Tiger	TSF, STF		
79	*Tirumala limniace exoticus*	Oriental Blue Tiger	TSF, STF		
80	*Tirumala septentrionis septentrionis*	Oriential Dark Blue Tiger	TSF, STF		
Subfamily: Apaturinae					
81	*Euripus nyctelius nyctelius*	Courtesan	TSF, STF	SC II	Endemic
82	*Helcyra hemina hemina*	Indian White Emperor	TSF, STF	SC I	Endemic
83	*Herona marathus marathus*	Assam Pasha	TSF, STF	SC II	Endemic

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84	*Hestinalis nama nama*	Sylhet Circe	TSF, STF, WTF		
85	*Mimathyma ambica ambica*	East Himalayan Purple Emperor	TSF, STF		
86	*Chitoria sordida sordida*	Sordid Emperor	TSF	SC II	Endemic
87	*Rohana parisatis parisatis*	Assam Black Prince	TSF, STF		
88	*Rohana parvata parvata*	Himalayan Brown Prince	STF, WTF	SC II	Endemic
89	*Sephisa chandra chandra*	Indian Eastern Courtier	TSF, STF, WTF	SC I	Endemic
Subfamily: Biblidinae					
90	*Ariadne merione tapestrina*	Intricate Common Castor	TSF, STF		
Subfamily: Calinaginae					
91	*Calinaga gautama*	Elongated Freak	TSF, STF		Endemic
Subfamily: Charaxinae					
92	*Charaxes bernardus hierax*	Variable Tawny Rajah	TSF, STF	SC II	
93	*Charaxes bharata*	Indian Nawab	TSF, STF		
94	*Charaxes dolon centralis*	Himalayan Stately Nawab	TSF, STF	SC II	Endemic
95	*Charaxes eudamippus eudamippus*	Himalayan Great Nawab	TSF, STF		
96	*Charaxes marmax marmax*	Yellow Rajah	TSF, STF	SC II	
Subfamily: Cyrestinae					
97	*Chersonesia risa risa*	Oriental Common Maplet	TSF, STF		
98	*Cyrestis thyodamas thyodamas*	Oriental Map Butterfly	TSF, STF		Endemic
Subfamily: Heliconiinae					
99	*Acraea issoria issoria*	Himalayan Yellow Coster	TSF, STF, WTF		
100	*Cethosia biblis tisamena*	Himalayan Red Lacewing	TSF, STF, WTF	SC II	Endemic
101	*Cethosia cyane cyane*	Bengal Leopard Lacewing	TSF, STF		
102	*Argynnis childreni childreni*	Himalayan Large Silverstripe	TSF, STF		
103	*Argynnis hyperbius hyperbius*	Chinese Tropical Fritillary	TSF, STF, WTF		
104	*Issoria issaea*	Himalayan Queen Fritillary	STF, WTF		
105	*Cirrochroa aoris aoris*	Himalayan Large Yeoman	TSF, STF		Endemic
106	*Phalanta phalantha*	Oriental Common Leopard	TSF, STF		
107	*Vindula erota erota*	Cruiser	TSF, STF		Endemic
Subfamily: Libytheinae					
108	*Libythea lepita lepita*	Himalayan Common Beak	TSF, STF	SC II	
109	*Libythea myrrha sanguinalis*	Ochreous Club Beak	TSF, STF		
Subfamily: Limenitidinae					
110	*Abrota ganga ganga*	Assam Sergeant-major	TSF, STF		Endemic
111	*Bassarona durga durga*	Himalayan Blue Duke	TSF, STF	SC I	Endemic
112	*Euthalia aconthea garuda*	Himalayan Common Baron	TSF, STF	SC II	
113	*Euthalia alpheda jama*	Himalayan Streaked Baron	TSF, STF		Endemic
114	*Euthalia franciae franciae*	Himalayan French Duke	TSF, STF, WTF	SC II	Endemic
115	*Euthalia iva iva*	Himalayan Grand Duke	TSF, STF	SC I	Endemic
116	*Euthalia lubentina lubentina*	Chinese Gaudy Baron	TSF, STF		
117	*Euthalia monina kesava*	Assam Powdered Baron	TSF, STF		Endemic
118	*Euthalia nara nara*	Himalayan Bronze Duke	TSF, STF, WTF	SC II	Endemic
119	*Euthalia phemius phemius*	Sylhet White-edged Blue Baron	TSF, STF		Endemic
120	*Euthalia sahadeva sahadeva*	Chinese Green Duke	TSF, STF, WTF		Endemic
121	*Euthalia saitaphernes saitaphernes*	Himalayan Spotless Baron	TSF, STF		Endemic
122	*Euthalia telchinia*	Blue Baron	TSF, STF	SC I	Endemic

	Scientific name	Common name	Habitats	W(P)AA, 2022	Endemic to northeastern India
123	*Neurosigma siva siva*	Sylhet Panther	STF, BTF	SC II	Endemic
124	*Tanaecia julii appiades*	Changeable Common Earl	TSF, STF		
125	*Athyma cama cama*	Himalayan Orange Staff Sergeant	TSF, STF		
126	*Athyma inara inara*	Colour Sergeant	TSF		
127	*Athyma jina jina*	Bhutan Sergeant	TSF, STF	SC I	Endemic
128	*Athyma orientalis*	Elongated Sergeant	TSF, STF, WTF		
129	*Athyma ranga ranga*	Himalayan Blackvein Sergeant	TSF, STF	SC II	Endemic
130	*Athyma selenophora bahula*	Sylhet Staff Sergreant	TSF, STF		Endemic
131	*Athyma zeroca zeroca*	Khasi Small Staff Sergeant	TSF, STF		
132	*Auzakia danava danava*	Indian Commodore	TSF, STF, WTF	SC II	
133	*Moduza procris procris*	Oriental Commander	TSF, STF, WTF		
134	*Parasarpa dudu dudu*	Sylhet White Commodore	TSF, STF, WTF	SC II	Endemic
135	*Parasarpa zayla zayla*	Himalayan Bicolor Commodore	TSF, STF, WTF		Endemic
136	*Sumalia daraxa daraxa*	Sylhet Green Commodore	TSF, STF, WTF		Endemic
137	*Sumalia zulema*	Scarce White Commodore	STF, WTF	SC I	Endemic
138	*Neptis ananta ochracea*	East Himalayan Yellow Sailer	TSF, STF, WTF		Endemic
139	*Neptis cartica cartica*	Himalayan Plain Sailer	TSF, STF		Endemic
140	*Neptis clinia susruta*	Himalayan Sullied Sailer	TSF, STF	SC II	Endemic
141	*Neptis hylas varmona*	Indian Common Sailer	TSF, STF		
142	*Neptis manasa manasa*	Himalayan Pale Hockeystick Sailer	TSF, STF, WTF	SC II	Endemic
143	*Neptis nata adipala*	Khasi Clear Sailer	TSF, STF		Endemic
144	*Neptis nycteus nycteus*	Sikkim Hockeystick Sailer	STF, WTF	SC I	Endemic
145	*Neptis pseudovikasi*	False Dingy Sailer	TSF, STF		
146	*Neptis radha radha*	Himalayan Great Yellow Sailer	TSF, STF	SC II	
147	*Neptis sankara amba*	East Himalayan Broad-banded Sailer	TSF, STF	SC II	Endemic
148	*Neptis sappho astola*	Himalayan Rusty Sailer	TSF, STF		
149	*Neptis soma soma*	Sylhet Creamy Sailer	TSF, STF	SC II	Endemic
150	*Neptis zaida bhutanica*	East Himalayan Pale Green Sailer	TSF, STF	SC II	
151	*Pantoporia hordonia hordonia*	Oriental Common Lascar	TSF, STF		
152	*Pantoporia paraka paraka*	Oriental Perak Lascar	TSF, STF		Endemic
153	*Phaedyma columella*	Short-banded Sailer	TSF, STF	SC II	
Subfamily: Pseudergolinae					
154	*Dichorragia nesimachus nesimachus*	Himalayan Constable	TSF, STF		
155	*Pseudergolis wedah wedah*	Himalayan Tabby	TSF, STF, WTF		
156	*Stibochiona nicea nicea*	Himalayan Popinjay	TSF, STF, WTF		
Subfamily: Satyrinae					
157	*Aemona amathusia*	Yellow Dryad	STF, WTF		Endemic
158	*Discophora sondaica zal*	Indian Common Duffer	TSF	SC I	Endemic
159	*Discophora timora timora*	Great Duffer	TSF		Endemic
160	*Enispe euthymius euthymius*	Himalayan Red Caliph	TSF, STF, WTF		Endemic
161	*Stichophthalma camadeva camadeva*	Northern Jungle Queen	TSF, STF	SC I	Endemic
162	*Thaumantis diores diores*	Assam Jungleglory	TSF, STF, WTF		Endemic
163	*Elymnias malelas malelas*	Bengal Spotted Palmfly	TSF, STF	SC II	Endemic
164	*Elymnias patna patna*	Larger Blue-striped Palmfly	TSF, STF		
165	*Elymnias vasudeva*	Jezebel Palmfly	TSF, STF	SC II	Endemic
166	*Melanitis leda leda*	Oriental Common Evening Brown	TSF, STF		

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167	*Melanitis phedima bela*	Bengal Dark Evening Brown	TSF, STF, WTF		
168	*Melanitis zitenius zitenius*	Himalayan Great Evening Brown	TSF, STF	SC II	
169	*Aulocera brahminus*	Narrow-banded Satyr	STF		
170	*Aulocera loha japroa*	Doherty's Satyr	STF		Endemic
171	*Callerebia narasingha narasingha*	Himalayan Mottled Argus	TSF, STF	SC I	Endemic
172	*Callerebia scanda opima*	East Himalayan Pallid Argus	WTF	SC II	Endemic
173	*Lethe baladeva baladeva*	Himalayan Treble Silverstripe	TSF, STF, WTF	SC II	Endemic
174	*Lethe bhairava*	Rusty Forester	STF, WTF		Endemic
175	*Lethe brisanda*	Dark Forester	WTF	SC II	Endemic
176	*Lethe chandica chandica*	Darjeeling Angled Red Forester	TSF, STF		Endemic
177	*Lethe confusa confuse*	Himalayan Banded Treebrown	TSF, STF, WTF		
178	*Lethe distans*	Scarce Red Forester	TSF, STF	SC I	Endemic
179	*Lethe dura gammiei*	Bhutan Scarce Lilacfork	TSE, STF	SC I	Endemic
180	*Lethe gulnihal gulnihal*	Dull Forester	STF	SC I	Endemic
181	*Lethe isana dinarbas*	Himalayan Common Forester	STF, WTF	SC II	Endemic
182	*Lethe kansa*	Bamboo Forester	TSF, STF		
183	*Lethe latiaris latiaris*	Himalayan Pale Forester	STF, WTF	SC II	Endemic
184	*Lethe margaritae*	Bhutan Treebrown	STF, WTF	SC I	Endemic
185	*Lethe mekara mekara*	Darjeeling Common Red Forester	TSF, STF, WTF		Endemic
186	*Lethe nicetas*	Yellow Woodbrown	STF, WTF		
187	*Lethe nicetella*	Small Woodbrown	WTF, SAF	SC II	Endemic
188	*Lethe ramadeva*	Single Silverstripe	STF	SC I	Endemic
189	*Lethe scanda*	Blue Forester	STF, WTF	SC II	Endemic
190	*Lethe serbonis*	Brown Forester	WTF	SC II	Endemic
191	*Lethe siderea sidereal*	Himalayan Scarce Woodbrown	STF, WTF	SC II	
192	*Lethe sidonis*	Common Woodbrown	STF, WTF, SAF		
193	*Lethe sinorix sinorix*	Assam tailed Red Forester	TSF, STF	SC II	
194	*Lethe sura*	Lilacfork	STF, WTF		Endemic
195	*Lethe verma sintica*	East Himalayan Straight-banded Treebrown	TSF, STF, WTF		Endemic
196	*Lethe visrava*	White-edged Woodbrown	STF, WTF	SC II	Endemic
197	*Mycalesis francisca sanatana*	Himalayan Lilacine Bushbrown	TSF, STF		
198	*Mycalesis suaveolens suaveolens*	East Himalayan Vanilla Bushbrown	TSF, STF	SC II	Endemic
199	*Mycalesis visala visala*	Indian Long-branded Bushbrown	TSF, STF, WTF		
200	*Neope bhadra*	Tailed Labyrinth	TSF, STF, WTF		Endemic
201	*Neope pulaha pulaha*	East Himalayan Veined Labyrinth	TSF, STF, WTF	SC II	Endemic
202	*Neope yama yama*	Bhutanese Dusky Labyrinth	STF, WTF	SC II	Endemic
203	*Orinoma damaris damris*	Himalayan Tigerbrown	TSF, STF		
204	*Orsotriaena medus medus*	Oriental Medus Brown	TSF		
205	*Ragadia crisilda crisilda*	Sylhet White-striped Ringlet	TSF, STF	SC II	Endemic
206	*Ragadia crito*	Dusky-striped Ringlet	TSF, STF		Endemic
207	*Rhaphicera moorei mantra*	Himalayan Small Tawny Wall	WTF, SAF		Endemic
208	*Rhaphicera satricus satricus*	Himalayan Large Tawny Wall	WTF, SAF	SC II	Endemic
209	*Telinga heri*	Large-eyed Bushbrown	TSF, STF	SC II	
210	*Telinga malsara*	White-line Bushbrown	TSF, STF		Endemic
211	*Telinga mestra vetus*	Bhutan White-edged Bushbrown	STF, WTF	SC II	Endemic

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212	*Telinga nicotia*	Bright-eye Bushbrown	TSF, STF		
213	*Ypthima baldus baldus*	Himalayan Common Five-ring	TSF, STF, WTF		
214	*Ypthima newara newara*	Himalayan Newar Three-ring	TSF, STF, WTF		Endemic
215	*Ypthima sacra sakra*	East Himalayan Five-ring	TSF, STF, WTF		
216	*Neorina hilda*	Yellow Owl	WTF, SAF	SC II	Endemic
Subfamily: Nymphalinae					
217	*Hypolimnas bolina jacintha*	Oriental Great Eggfly	TSF, STF		
218	*Junonia almana almana*	Oriental Peacock Pansy	STF		
219	*Junonia atlites atlites*	Oriental Grey Pansy	TSF, STF		
220	*Junonia hierta hierta*	Oriental Yellow Pansy	TSF, STF		
221	*Junonia iphita iphita*	Oriental Chocolate Pansy	TSF, STF, WTF		
222	*Junonia lemonias lemonias*	Lemon Pansy	TSF, STF		Endemic
223	*Junonia orithya*	Blue Pansy	STF		
224	*Doleschallia bisaltide indica*	Himalayan Autumn Leaf	TSF, STF	SC II	Endemic
225	*Kallima inachus inachus*	Himalayan Orange Oakleaf	TSF, STF, WTF		
226	*Kallima knyvettii*	Scarce Blue Oakleaf	TSF, STF	SC II	Endemic
227	*Aglais caschmirensis aesis*	Himalayan Tortoiseshell	TSF, STF, WTF, SAF		
228	*Kaniska canace canace*	Chinese Blue Admiral	TSF, STF, WTF		
229	*Symbrenthia brabira brabira*	Himalayan Yellow Jester	TSF, STF, WTF		
230	*Symbrenthia hypselis cotanda*	Himalayan Spotted Jester	TSF, STF		
231	*Symbrenthia lilaea khasiana*	Khasi Common Jester	TSF, STF, WTF		
232	*Symbrenthia niphanda niphanda*	Himalayan Blue-tailed Jester	TSF, STF, WTF	SC II	Endemic
233	*Symbrenthia silana*	Scarce Jester	TSF, STF	SC I	Endemic
234	*Vanessa cardui*	Painted Lady	TSF, STF, WTF, SAF		
235	*Vanessa indica indica*	Himalayan Red Admiral	TSF, STF, WTF, SAF		
Family: Lycaenidae **Subfamily: Curetinae**					
236	*Curetis bulis bulis*	Bright Sunbeam	TSF, STF		
Subfamily: Lycaeninae					
237	*Heliophorus brahma brahma*	Himalayan Golden Sapphire	TSF, STF, WTF, SAF		Endemic
238	*Heliophorus epicles latilimbata*	Himalayn Purple Sapphire	TSF, STF, WTF, SAF		
239	*Heliophorus indicus*	Dark Sapphire	TSF, STF, WTF		Endemic
240	*Heliophorus moorei moorei*	Bhutan Azure Sapphire	STF, WTF, SAF		Endemic
241	*Heliophorus tamu tamu*	Himalayan Powdery Green Sapphire	STF, WTF		
242	*Heliophorus pseudonexus*	Modest Sapphire	TSF, STF, WTF		Endemic
Subfamily: Miletinae					
243	*Allotinus drumila drumila*	Himalayan Crenulate Mottle	TSF, STF	SC I	
244	*Miletus chinensis assamensis*	Assam Common Mottle	TSF, STF		
245	*Taraka hamada mendesia*	Mendacious Forest Pierrot	TSF, STF		Endemic
Subfamily: Polyommatinae					
246	*Anthene emolus emolus*	Bengal Common Ciliate Blue	TSF, STF		
247	*Anthene lycaenina lycambes*	Himalayan Pointed Ciliate Blue	TSF, STF	SC II	Endemic
248	*Acytolepis puspa gisca*	Himalayan Common Hedge Blue	TSF, STF, WTF		
249	*Caleta elna noliteia*	Indo-Chinese Elbowed Pierrot	TSF, STF		

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250	*Catochrysops panormus exiguus*	Malay Silver Forget-me-not	TSF, STF		
251	*Catochrysops strabo strabo*	Oriental Forget-me-not	TSF, STF		
252	*Celastrina argiolus iynteana*	Hill Hedge Blue	TSF, STF		Endemic
253	*Celastrina lavendularis*	Eastern Plain Hedge Blue	TSF, STF		
254	*Celatoxia marginata marginata*	Sikkim Margined Hedge Blue	TSF, STF		
255	*Chilades pandava pandava*	Oriental Plains Cupid	TSF, STF		
256	*Ionolyce helicon marguiana*	Pointed Lineblue	TSF	SC II	Endemic
257	*Jamides alecto eurysaces*	Himalayan Metallic Cerulean	TSF, STF, WTF	SC II	
258	*Jamides bochus bochus*	Indian Dark Cerulean	TSF, STF		
259	*Jamides celeno celeno*	Oriental Common Cerulean	TSF, STF, WTF		
260	*Jamides elpis*	Glistening Cerulean	TSF, STF, WTF		Endemic
261	*Jamides pura pura*	Continental White Cerulean	TSF, STF, WTF	SC II	Endemic
262	*Lampides boeticus*	Pea Blue	TSF, STF, WTF		
263	*Leptotes plinius plinius*	Zebra Blue	TSF, STF, WTF		
264	*Lestranicus transpectus*	White-banded Hedge Blue	TSF, STF		Endemic
265	*Megisba malaya sikkima*	Malayan	TSF, STF, WTF	SC II	
266	*Nacaduba beroe gythion*	Assam Opaque Six-Lineblue	STF		
267	*Nacaduba kurava euplea*	Sikkim Transparent Six-Lineblue	TSF, STF		
268	*Nacaduba pactolus continentalis*	Continental Large Four-Lineblue	TSF, STF	SC II	
269	*Neopithecops zalmora zalmora*	Myanmar Common Quaker	TSF, STF		
270	*Orthomiella pontis pontis*	Darjeeling Straightwing Blue	STF, WTF	SC II	Endemic
271	*Petrelaea dana*	Dingy Lineblue	TSF, STF, WTF		
272	*Prosotas bhutea*	Bhutia Lineblue	TSF, STF, WTF	SC II	Endemic
273	*Prosotas dubiosa indica*	Indian Tailless Lineblue	TSF, STF, WTF	SC II	
274	*Prosotas nora ardates*	Indian Common Lineblue	TSF, STF, WTF		
275	*Prosotas pia marginate*	Margined Additional Lineblue	TSF, STF, WTF		Endemic
276	*Tarucus ananda*	Dark Pierrot	TSF, STF		
277	*Udara albocaeruleus albocaeruleus*	Himalayan Albocerulean	TSF, STF	SC II	
278	*Udara dilectus dilectus*	Himalayan Pale Hedge Blue	TSF, STF, WTF		
279	*Pseudozizeeria maha maha*	Himalayan Pale Grass Blue	TSF, STF, WTF		
280	*Zizeeria karsandra*	Dark Grass Blue	TSF, STF, WTF		
281	*Zizula hylax hylax*	Indian Tiny Grass Blue	TSF, STF		
Subfamily: Poritiinae					
282	*Poritia hewitsoni hewitsoni*	Himalayan Common Gem	TSF, STF, WTF	SC II	
Subfamily: Theclinae					
283	*Iraota timoleon timoleon*	Oriental Silverstreak Blue	TSF, STF		
284	*Cigaritis evansii evansii*	Naga Rufous Silverline	TSF, STF, WTF		Endemic
285	*Cigaritis lohita himalayanus*	Himalayan Long-banded Silver	TSF, STF, WTF	SC II	
286	*Cigaritis rukma*	Cinnamon Silverline	TSF, STF, WTF		Endemic
287	*Cigaritis rukmini*	Khaki Silverline	TSF, STF, WTF	SC II	Endemic
288	*Cigaritis syama*	Club Silverline	TSF, STF, WTF		
289	*Arhopala bazalus teesta*	Teesta Powdered Oakblue	STF, WTF		
290	*Arhopala eumolphus eumolphus*	Bengal Green Oakblue	STF, WTF		
291	*Arhopala paraganesa zephyretta*	Patkai Dusky Bushblue	STF, WTF	SC II	Endemic
292	*Arhopala paramuta paramuta*	Sikkim Hooked Oakblue	STF, WTF		Endemic
293	*Arhopala rama*	Himalayan Dark Oakblue	STF, WTF		

	Scientific name	Common name	Habitats	W(P)AA, 2022	Endemic to northeastern India
294	*Arhopala singla*	Pointed Oakblue	STF, WTF		
295	*Flos areste*	Tailless Plushblue	STF, WTF	SC II	Endemic
296	*Flos chinensis*	Chinese Plushblue	STF, WTF		Endemic
297	*Flos fulgida fulgida*	Shining Plushblue	STF, WTF		Endemic
298	*Surendra quercetorum*	Himalayan Common Acacia Blue	TSF, STF		
299	*Acupicta delicatum*	Dark Tinsel	TSF, STF	SC II	Endemic
300	*Catapaecilma major*	Himalayan Common Tinsel	TSF, STF	SC II	
301	*Cheritrella truncipennis*	Truncate Imperial	STF, WTF	SC II	Endemic
302	*Drupadia scaeva cyara*	Himalayan Blue Posy	TSF, STF	SC I	Endemic
303	*Ticherra acte acte*	Himalayan Blue Imperial	TSF, STF, WTF		
304	*Deudorix epijarbas epijarbas*	Oriental Cornelian	TSF, STF		
305	*Rapala damona*	Malay Red Flash	TSF, STF		
306	*Rapala manea schistacea*	Bengal Slate Flash	TSF, STF		
307	*Rapala nissa ranta*	Himalayan Common Flash	TSF, STF		Endemic
308	*Rapala pheretima petosiris*	Copper Flash	TSF, STF		
309	*Rapala refulgens*	Refulgent Flash	TSF, STF	SC II	Endemic
310	*Rapala tara*	Branded Flash	TSF, STF		
311	*Rapala varuna*	Indigo Flash	TSF, STF	SC II	
312	*Sinthusa chandrana grotei*	East Himalayan Broad Spark	TSF, STF	SC II	Endemic
313	*Sinthusa nasaka amba*	Malayan Narrow Spark	TSF, STF	SC II	Endemic
314	*Hypolycaena erylus himavantus*	Sikkim Common Tit	TSF, STF		Endemic
315	*Hypolycaena kina kina*	Darjeeling Blue Tit	TSF, STF, WTF	SC II	
316	*Hypolycaena othona othona*	Oriental Orchid Tit	TSF, STF	SC I	
317	*Zeltus amasa amasa*	Indian Fluffy Tit	TSF, STF		
318	*Neocheritra fabronia fabronia*	Indo-Chinese Pale Grand Imperial	TSF, STF, WTF	SC II	Endemic
319	*Tajuria maculatus*	Spotted Royal	TSF, STF		
320	*Tajuria yajna istroidea*	Chestnut-and-Black Royal	TSF	SC I	Endemic
321	*Tajuria diaeus diaeus*	Himalayan Straightline Royal	TSF	SC II	
322	*Creon cleobis* (Godart, [1824])	Broad-tail Royal	TSF		
323	*Ancema ctesia ctesia*	Himalayan Bi-spot Royal	TSF, STF, WTF		
324	*Remelana jangala*	Northern Chocolate Royal	TSF, STF	SC II	Endemic
325	*Euaspa milionia milionia*	Himalayan Water Hairstreak	TSF, STF		
326	*Euaspa pavo*	Peacock Hairstreak	TSF, STF	SC I	Endemic
327	*Shirozuozephyrus kirbariensis*	Kirbari Hairstreak	STF	SC II	Endemic
Family: Riodinidae **Subfamily: Nemeobiinae**					
328	*Abisara chela chela*	Sikkim Spot Judy	TSF, STF, WTF		Endemic
329	*Abisara fylla*	Dark Judy	TSF, STF, WTF		
330	*Abisara neophron neophronides*	Khasi tailed Judy	TSF, STF, WTF		Endemic
331	*Dodona adonira*	Himalayan Striped Punch	STF, WTF	SC II	Endemic
332	*Dodona dipoea dipoea*	Himalayan Lesser Punch	STF, WTF, SAF	SC II	Endemic
333	*Dodona egeon egeon*	Himalayan Orange Punch	TSF, STF	SC II	
334	*Dodona eugenes venox*	Tailed Punch	TSF, STF, WTF		Endemic
335	*Dodona ouida ouida*	Darjeeling Mixed Punch	TSF, STF, WTF		Endemic
336	*Zemeros flegyas flegyas*	Himalayan Punchinello	TSF, STF, WTF		

	Scientific name	Common name	Habitats	W(P)AA, 2022	Endemic to northeastern India
Family: Hesperiidae Subfamily: Coeliadinae					
337	*Badamia exclamationis*	Brown Awl	TSF		
338	*Burara amara*	Small Green Awlet	TSF, STF		
339	*Burara gomata gomata*	Bengal Pale Green Awlet	TSF, STF		Endemic
340	*Burara jaina jaina*	Darjeeling Common Orange Awlet	TSF, STF		
341	*Burara oedipodea belesis*	Himalayan Branded Orange Awlet	TSF, STF		
342	*Burara vasutana*	Green Awlet	TSF, STF		
343	*Choaspes spp.*	Awlking spp.	TSF, STF		
344	*Hasora anura anura*	Himalayan Slate Awl	TSF, STF, WTF		
345	*Hasora badra badra*	Oriental Common Awl	TSF, STF		
346	*Hasora chromus chromus*	Oriental Common Banded Awl	TSF, STF		
347	*Hasora taminatus bhavara*	Himalayan White-banded Awl	TSF, STF, WTF		
348	*Hasora vita indica*	Indian Plain Banded Awl	TSF, STF, WTF		
Subfamily: Hesperiinae					
349	*Aeromachus jhora jhora*	Sikkim Grey Scrub Hopper	TSF, STF, WTF		Endemic
350	*Aeromachus pygmaeus*	Pygmy Scrub Hopper	TSF, STF, WTF		
351	*Aeromachus stigmata stigmata*	Himalayan Veined Scrub Hopper	TSF, STF, WTF		
352	*Ampittia subvittatus subradiatus*	Khasi Tiger Hopper	TSF, STF		Endemic
353	*Ancistroides nigrita diocles*	Bengal Chocolate Demon	TSF, STF, WTF		
354	*Erionota torus*	Rounded Palm-redeye	TSF, STF		
355	*Halpe aucma*	Gold-spotted Ace	TSF		Endemic
356	*Halpe filda*	Absent Ace	TSF, STF, WTF		Endemic
357	*Halpe zema zema*	Sikkim Zema Banded Ace	TSF, STF, WTF		Endemic
358	*Iambrix salsala salsala*	Eastern Chestnut Bob	TSF, STF		
359	*Koruthaialos butleri*	Dark Velvet Bob	TSF, STF		Endemic
360	*Matapa aria*	Common Branded Redeye	TSF, STF		
361	*Matapa cresta*	Fringed Branded Redeye	TSF, STF		
362	*Matapa druna*	Grey-branded Redeye	TSF, STF		
363	*Matapa sasivarna*	Black-veined Branded Redeye	TSF, STF		Endemic
364	*Notocrypta curvifascia*	Restricted Demon	TSF, STF, WTF		
365	*Notocrypta feisthamelii alysos*	Himalayan Spotted Demon	TSF, STF, WTF		
366	*Notocrypta paralysos*	Common Banded Demon	TSF, STF, WTF		
367	*Pedesta masuriensis masuriensis*	White-spotted Mussoorie Bush Bob	TSF, STF, WTF		
368	*Pedesta pandita*	Brown Bush Bob	TSF, STF, WTF		Endemic
369	*Pirdana major*	Himalayan Green-striped Palmer	TSF, STF		Endemic
370	*Pithauria murdava*	Dark Straw Ace	TSF, STF, WTF		Endemic
371	*Pithauria stramineipennis*	Light Straw Ace	TSF, STF, WTF		Endemic
372	*Scobura cephala*	Extra Forest Bob	TSF, STF		Endemic
373	*Sebastonyma dolopia*	Tufted Ace	TSF, STF, WTF		Endemic
374	*Sovia separata separata*	Chequered Ace	TSF, STF		
375	*Zographetus satwa*	Purple and Gold Flitter	TSF, STF		
376	*Zographetus dzonguensis*	Chocolate-bordered Flitter	TSF		Endemic
377	*Salanoemia noemi*	Yellow Spotted Lancer	TSF		Endemic
378	*Baoris farri*	Complete Paint-brush Swift	TSF, STF, WTF		
379	*Baoris pagana*	Figure-of-8 Swift	TSF, STF		Endemic

	Scientific name	Common name	Habitats	W(P)AA, 2022	Endemic to northeastern India
380	*Borbo bevani*	Lesser Rice Swift	TSF, STF		
381	*Borbo cinnara*	Rice Swift	TSF, STF		
382	*Caltoris tulsi tulsi*	Himalayan Purple Swift	TSF, STF, WTF		Endemic
383	*Parnara guttatus mangala*	Himalayan Straight Swift	TSF, STF, WTF		
384	*Pelopidas agna agna*	Bengal Obscure Branded Swift	TSF, STF		
385	*Pelopidas assamensis*	Great Swift	TSF, STF, WTF		
386	*Pelopidas sinensis*	Chinese Branded Swift	TSF, STF, WTF		
387	*Polytremis discreta discreta*	Himalayan White-fringed Swift	TSF, STF, WTF		
388	*Polytremis eltola eltola*	Darjeeling Yellow-spot Swift	TSF, STF, WTF		
389	*Cephrenes acalle oceanica*	Variable Plain Palm-Dart	TSF, STF, WTF		
390	*Oriens gola pseudolus*	Oriental Common Dartlet	TSF, STF, WTF		
391	*Oriens goloides*	Smaller Dartlet	TSF, STF, WTF		
392	*Telicota bambusae bambusae*	Oriental Dark Palm-Dart	TSF, STF, WTF		
Subfamily: Pyrginae					
393	*Celaenorrhinus badia*	Scarce Banded Flat	TSF, STF, WTF		Endemic
394	*Celaenorrhinus dhanada*	Yellow-banded Flat	TSF, STF, WTF		
395	*Celaenorrhinus leucocera*	Common Spotted Flat	TSF, STF, WTF		
396	*Celaenorrhinus munda*	Himalayan Spotted Flat	TSF, STF, WTF		
397	*Celaenorrhinus patula*	Large Spotted Flat	TSF, STF, WTF		Endemic
398	*Celaenorrhinus ratna*	East Himalayan Ratna Flat	TSF, STF, WTF		
399	*Celaenorrhinus putra putra*	Restricted Spotted Flat	TSF, STF, WTF		
400	*Pseudocoladenia dan fabia*	Himalayan Fulvous Pied Flat	TSF, STF, WTF		Endemic
401	*Pseudocoladenia fatua*	Ruddy Pied Flat	TSF, STF, WTF		Endemic
402	*Pseudocoladenia festa*	Dull Pied Flat	TSF, STF		Endemic
403	*Pintara tabrica*	Crenulate Orange Flat	TSF, STF		
404	*Capila jayadeva*	Striped Dawnfly	TSF, STF		Endemic
405	*Capila lidderdali*	Ringed Dawnfly	TSF, WTF		Endemic
406	*Chamunda chamunda*	Olive Flat	TSF, STF		Endemic
407	*Coladenia agni agni*	Himalayan Brown Pied Flat	TSF, STF		Endemic
408	*Coladenia hoenei*	Large Spot Pied Flat	TSF, STF		Endemic
409	*Ctenoptilum vasava vasava*	Himalayan Tawny Angle	TSF, STF		Endemic
410	*Darpa hanria*	Hairy Angle	TSF, STF, WTF		
411	*Gerosis phisara phisara*	Khasi Dusky Yellow-breast Flat	TSF, STF		Endemic
412	*Gerosis sinica narada*	Sikkim White Yellow-breasted Flat	TSF, STF		Endemic
413	*Mooreana trichoneura pralaya*	Yellow-veined Flat	TSF, STF		Endemic
414	*Odontoptilum angulata angulata*	Oriental Chestnut Angle	TSF, STF		
415	*Satarupa gopala gopala*	Sikkim Large White Flat	TSF, STF, WTF		Endemic
416	*Satarupa zulla zulla*	Himalayan Equal White Flat	TSF, STF, WTF		Endemic
417	*Seseria dohertyi dohertyi*	Himalayan Contiguous Seseria	TSF, STF		
418	*Seseria sambara sambara*	Himalayan Notched Seseria	TSF, STF		
419	*Tagiades litigiosa litigiosa*	Sylhet Water Snow Flat	TSF, STF, WTF		
420	*Tagiades menaka menaka*	Bengal Spotted Flat	TSF, STF, WTF		

TSF—Tropical semi-evergreen forest | STF—Sub-tropical hill forest | WTF—Wet temperate forest | SAF—Sub-alpine forest

Image 1. Papilionidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Graphium antiphates* | B—*Graphium chironides* | C—*Graphium eurous* | D—*Graphium paphus* | E—*Graphium xenocles* | F—*Graphium agamemnon* | G— *Papilio agestor* | H—*Papilio alcmenor* | I—*Papilio arcturus* | J—*Papilio bootes* | K—*Papilio demoleus* | L—*Papilio epycides* | M—*Papilio krishna* | N—*Papilio chaon* | O—*Papilio agenor* | P—*Meandrusa lachinus* | Q—*Teinopalpus imperialis* | R—*Byasa dasarada* | S—*Byasa latreillei* | T—*Troides aeacus*. © Monish Kumar Thapa, Sonam Wangchuk Lepcha and Q—Chumsi Lepcha.

13 individuals in 2019, but only two were recorded in 2020. This species was found at elevations just above 150 m, within jungle environments and along forest nursery roads. Notably, *Z. dzonguensis* was also observed actively flying around orange trees inside the jungle.

28. *Celaenorrhinus badia* (Hewitson, 1877)

First, this species was spotted inside the forested area at the village of Laven in Upper Dzongu, where five individuals were seen under the leaves. This species was later seen in the Namprickdang area, under similar conditions, with sightings ranging from four to six individuals.

29. *Chamunda chamunda* (Moore, 1866)

Observed in the Noam Village, inside a jungle near a small stream, where two individuals were seen actively flying under the leaves.

30. *Coladenia hoenei* (Evans, 1939)

Initially observed in the Namprickdang area, where

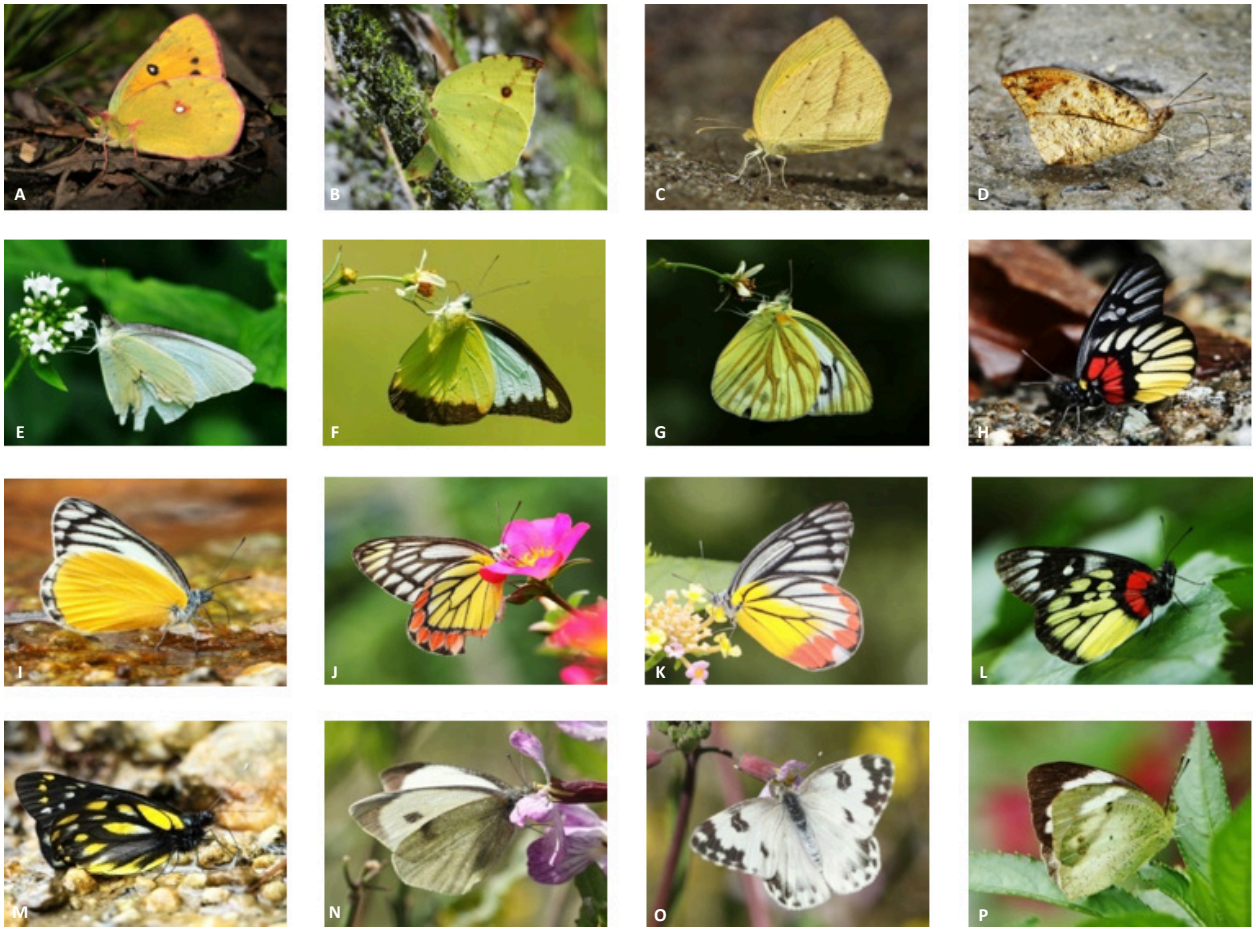

Image 2. Pieridae butterflies recorded in Dzongu, Sikkim during the study period: A—*Colias fieldii* | B—*Dercas lycorias* | C—*Eurema laeta* | D—*Hebomoia glaucippe* | E—*Appias albina* | F—*Appias lyncida* | G—*Cepora nerissa* | H—*Delias acalis* | I—*Delias agostina* | J—*Delias eucharis* | K—*Delias hyparete* | L—*Delias pasithoe* | M—*Delias sanaca* | N—*Pieris brassicae* | O—*Pontia daplidice* | P—*Ixias pyrene*. © Sonam Wangchuk Lepcha; C—Sonam Wangchuk Lepcha Jr.

a single specimen was seen flying among dry leaves. Another sighting occurred in Laven Village.

31. *Darpa hanria* (Moore, 1866)

Recorded at Lingza along a small river stream connected to the Talong Chu River, where it was found on a large rock with other butterflies during a sunny day. Later, this species was spotted at Blyokvoo, upper Dzongu, during mud puddling.

32. *Satarupa zulla* (Tytler, 1915)

This species was recorded in several locations including Laven, Passingdang, Panang, Tingvong, Blyokvoo, Ravong, and Phedang, lower Dzongu. Typically, individuals were seen singly, likely on bird droppings or mud, and were very active, commonly found on roadside rocks.

CONCLUSION

This long-term study allowed us to obtain a comprehensive understanding of the region's butterfly diversity and distribution. The study conducted in Dzongu Valley of northern Sikkim revealed a remarkable diversity of butterfly species, with a total of 420 species identified belonging to 187 genera under six families (Table 1). The survival of butterflies is closely linked to suitable habitats, the availability of nectar and host plants, and the conditions of their immediate environment, highlighting the interrelationship of these factors (Thapa et al. 2023). The availability of dissolved minerals in the water resources significantly contributes to the high butterfly diversity in the area, as it encourages adult butterflies to engage in mud-puddling in large groups on sandy patches along rivers. In Dzongu, these essential water resources include lakes, wetlands, and river beds, such as Tungkyong Dho (Lake)— a designated

Image 3a. Nymphalidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Danaus chrysippus* | B—*Tirumala limniace* | C—*Helcyra hemina* | D—*Herona marathus* | E—*Rohana parvata* | F—*Calinaga gautama* | G—*Charaxes marmax* | H—*Issoria issaea* | I— *Libythea myrrha* | J—*Bassarona durga* | K—*Euthalia franciae* | L—*Euthalia iva* | M—*Euthalia saitaphernes* | N—*Neurosigma siva* | O—*Parasarpa zayla* | P— *Neptis ananta* | Q—*Neptis manasa* | R—*Neptis nycteus* | S—*Aemona amathusia* | T—*Enispe euthymius.* © Sonam Wangchuk Lepcha & Monish Kumar Thapa; L—Mingdup Lepcha.

biodiversity Heritage Site of Dzongu- along with Lingthem Kyong, Talung Wetland, Lingdem Hotspring, Namprick Uung Kyong, Rungyoung River, Narim Uung Kyong, and others (Image 7). The presence of rare and exclusive butterfly species in the Dzongu region highlights the area's significant biodiversity potential and also indicates the presence of rare host plants.

The butterfly diversity in Dzongu is an indicator of rich biodiversity that includes a variety of flora and fauna thriving in pristine forests. The region is facing deforestation due to the expansion of human settlements, urbanization, and the clearing of land for agriculture. There is an urgent need to designate this forested region for heightened protection and conservation efforts, ensuring the preservation of its unique ecological value. This diversity not only enhances the ecological value of the region but also plays a crucial role in the broader environmental health of Sikkim, making it an invaluable area for both scientific study and conservation efforts. This study enriches

Image 3b. Nymphalidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Stichophthalma camadeva* | B—*Elymnias patna* | C—*Elymnias vasudeva* | D—*Callerebia narasingha* | E—*Callerebia scandal* | F—*Lethe baladeva* | G—*Lethe bhairava* | H—*Lethe brisanda* | I—*Lethe dura* | J—*Lethe margaritae* | K—*Lethe ramadeva* | L—*Lethe scanda* | M—*Lethe serbonis* | N—*Lethe visrava* | O—*Mycalesis suaveolens* | P—*Ragadia crisilda* | Q—*Rhaphicera satricus* | R—*Telinga mestra* | S—*Neorina hilda* | T—*Symbrenthia brabira.* © Sonam Wangchuk Lepcha; H—Dorjee Tshering Lepcha.

the understanding of butterfly diversity in northern Sikkim and also emphasizes the need for continued conservation efforts in these ecologically sensitive areas.

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Image 4a. Lycaenidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Heliophorus brahma* | B—*Heliophorus moorei* | C—*Heliophorus tamu* | D—*Heliophorus pseudonexus* | E—*Allotinus drumila* | F—*Caleta elna* | G—*Catochrysops panormus* | H—*Celastrina lavendularis* | I—*Chilades pandava* | J—*Ionolyce helicon* | K—*Jamides elpis* | L—*Leptotes plinius* | M—*Lestranicus transpectus* | N—*Nacaduba kurava* | O—*Nacaduba pactolus* | P—*Orthomiella pontis* | Q—*Petrelaea dana* | R—*Prosotas bhutea* | S—*Prosotas dubiosa* | T—*Prosotas pia*. © Sonam Wangchuk Lepcha; F—Dorjee Tshering Lepcha.

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Image 4b. Lycaenidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Udara albocaeruleus* | B—*Cigaritis evansii* | C—*Cigaritis lohita* | D—*Cigaritis rukma* | E—*Cigaritis rukmini* | F—*Arhopala bazalus* | G—*Arhopala paramuta* | H—*Flos chinensis* | I—*Flos fulgida* | J—*Surendra quercetorum* | K—*Catapaecilma major* | L—*Cheritrella truncipennis* | M—*Drupadia scaeva* | N—*Deudorix epijarbas* | O—*Rapala damona* | P—*Rapala manea* | Q—*Rapala pheretima* | R—*Rapala varuna* | S—*Sinthusa chandrana* | T—*Sinthusa nasaka.* © Sonam Wangchuk Lepcha; E—Mingdup Lepcha; I & L—Sonam Wangchuk Lepcha JR.

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Image 4c. Lycaenidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Hypolycaena erylus* | B—*Hypolycaena kina* | C—*Hypolycaena othona* | D—*Zeltus amasa* | E—*Neocheritra fabronia* | F—*Tajuria maculatus* | G—*Tajuria yajna* | H—*Ancema ctesia* | I—*Remelana jangala* | J—*Euaspa milionia* | K—*Euaspa pavo*. © Sonam Wangchuk Lepcha; E—Lhendup Lepcha; K—Janukit Lepcha.

Image 5. Riodinidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Abisara chela* | B—*Abisara fylla* | C—*Abisara neophron* | D—*Dodona adonira* | E—*Dodona dipoea* | F—*Dodona egeon* | G—*Dodona ouida* | H—*Zemeros flegyas*. © Sonam Wangchuk Lepcha.

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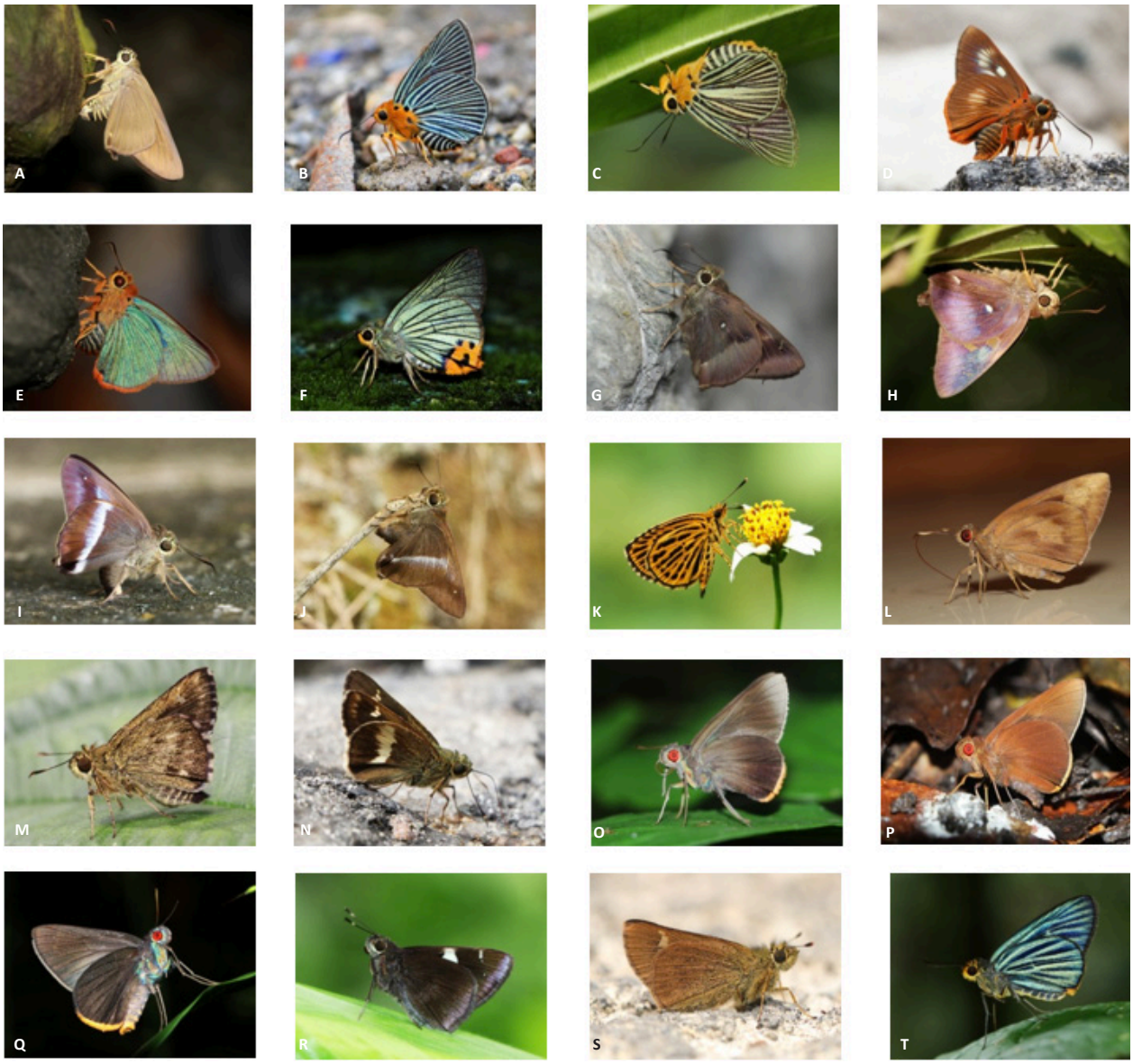

Image 6a. Hesperiidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Badamia exclamationis* | B—*Burara amara* | C—*Burara gomata* | D—*Burara jaina* | E—*Burara vasutana* | F—*Choaspes* sp. / G—*Hasora anura* | H—*Hasora badra* | I—*Hasora taminatus* | J—*Hasora vita* | K—*Ampittia subvittatus* | L—*Erionota torus* | M—*Halpe filda* | N—*Halpe zema* | O—*Matapa cresta* | P—*Matapa druna* | Q—*Matapa sasivarna* / R—*Notocrypta feisthamelii* | S—*Pedesta pandita* | T—*Pirdana major*. © Sonam Wangchuk Lepcha; B— Sonam Pintso Sherpa.

Image 6b. Hesperiidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Sovia separata* | B—*Zographetus satwa* | C—*Zographetus dzonguensis* | D—*Baoris pagana* | E—*Caltoris tulsi* | F—*Pelopidas assamensis* | G—*Pelopidas sinensis* | H—*Cephrenes acalle* | I—*Celaenorrhinus badia* | J—*Celaenorrhinus dhanada* | K—*Celaenorrhinus patula* | L—*Celaenorrhinus ratna* | M—*Pseudocoladenia fatua* | N—*Pintara tabrica* | O—*Capila jayadeva* | P—*Capila lidderdali* | Q—*Chamunda chamunda* | R—*Coladenia agni* | S—*Coladenia hoenei* | T—*Ctenoptilum vasava*. © Sonam Wangchuk Lepcha; K—Lhendup Lepcha, J & L— Sonam Wangchuk Lepcha JR., O—Chuzing Lepcha, P— Sonam Gyatso Lepcha.

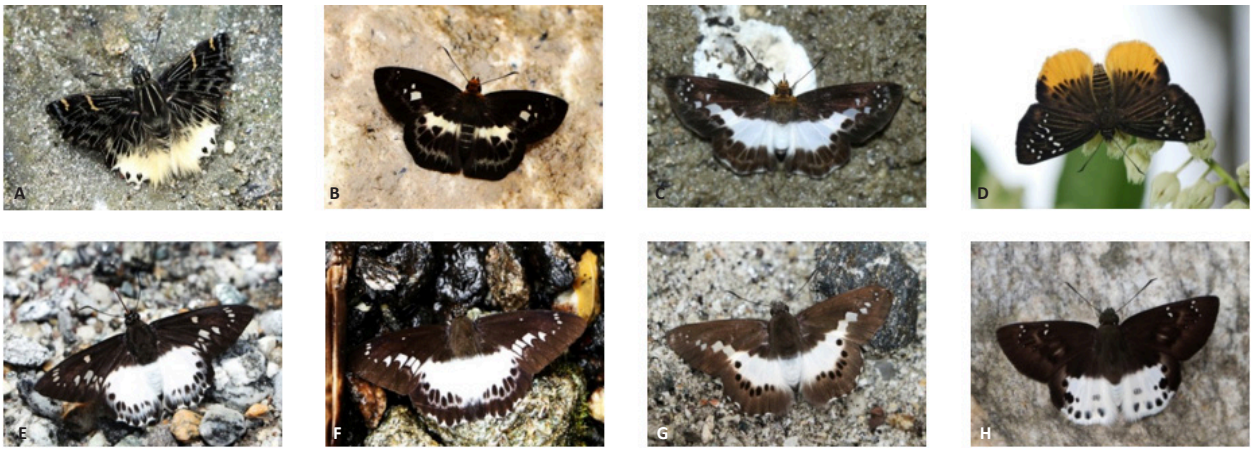

Image 6c. Hesperiidae butterflies recorded in Dzongu, Sikkim during the study period: A—*Darpa hanria* | B—*Gerosis phisara* | C—*Gerosis sinica* | D—*Mooreana trichoneura* | E—*Satarupa gopala* | F—*Satarupa zulla* | G—*Seseria dohertyi* | H—*Tagiades menaka*. © Sonam Wangchuk Lepcha

Image 7. Habitats of the study area. © Sonam Wangchuk Lepcha & Monish Kumar Thapa

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