

Butterfly fauna of Dhansiri Reserve Forest, Karbi Anglong, Assam, India

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ABSTRACT: The field survey carried out to document the baseline data of butterfly fauna of Dhansiri Reserve Forest of Karbi Anglong District, Assam, recorded 106 species belonging to six families. *Graphium sarpedon*, *Appias albina*, *Spindasis lohita*, *Charaxes marmax*, *Athyma ranga* and *Tanaecia lepidae*, *Hypolycaena othona* and *Euploea mulciber* are legally protected species under the Indian Wild Life (Protection) Amendment Act, 2022. *Eurema andersonii*, *Appias albina*, *Appias galba*, *Charaxes marmax* and *Athyma ranga* are some of the rare species recorded during the study. Record of rare and endemic species from this Reserve Forest, and presence of species legally protected under the Indian Wildlife (Protection) Amendment Act, marks its importance as an area for butterfly conservation.

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KEY WORDS: Lepidoptera, species richness, conservation, rare species

INTRODUCTION

Among insects, butterflies occupy an important position in the ecosystem (Ghazoul, 2002) and are considered to be flagship species for conservation (Thomas, 2005). Butterflies act as biological indicators of habitat quality, environmental changes and anthropogenic disturbance (Talbot, 1939; Pandhye *et al.*, 2012; Tiple, 2012; Kocher and Williams, 2000; Kunte 2000, 2023; Bhowmik, 2021; Das *et al.*, 2023). North East India is a part of the Eastern Himalayas Biodiversity hotspot, and is known as Biodiversity Hotspot for Butterfly fauna. The Eastern Himalaya is one of the richest areas of butterfly fauna (Saikia, 2011). In India the number of butterfly species is 1431 as per Kunte (2023), while Das *et al.* (2023) checklists 1379

butterfly species. Evans (1932) recorded 962 species of butterflies in Northeast India, while Das *et al.* (2023) reported 745 species in Eastern Himalaya and NE India.

Butterfly studies were earlier done in Cachar Hills (Wood-Mason and de Niceville 1887), Manipur and Naga Hills (Tytler, 1915), and Khasi and Jayantia Hills (Parsons and Cantlie, 1948), but there was no mention of Mikir Hills. Karbi Anglong District of Assam (earlier known as Mikir Hills district) is an area where scanty work has been done on butterfly taxonomic work. A few studies were done in Kaziranga-Karbi Hills (Gogoi, 2013, 2015), Garampani and Nambor Wildlife Sanctuary (Bawri *et al.*, 2014) and Nambor-Doigrung Wildlife Sanctuary (Mudai *et al.*, 2015). Goswami and

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Reddy (2021) reported *Appias galba* from Dhansiri Reserve Forest which is stated as rare according to Evans (1932). The species was earlier recorded by Parsons and Cantlie (1948) from Lumding, Upper Assam. Karbi Anglong harbors a rich floral and faunal diversity. But a comprehensive account of butterfly fauna in the protected areas and non-protected areas of Karbi Anglong is not available. The present work is an attempt to document the baseline data on butterfly fauna of Dhansiri Reserve Forest of Karbi Anglong District of Assam.

MATERIALS AND METHODS

The study was carried out in Dhansiri Reserve Forest of Assam. Dhansiri Reserve Forest is located in Karbi Anglong District of Assam. Dhansiri is the second largest reserve forest of Assam with an area of 770.38 km², bordering Intanki National Park of Nagaland. It is a part of Dhansiri-Lumding Elephant Reserve. The area consisting of undulating plains and low hills is a part of Karbi Plateau. Dhansiri river is the major river flowing through Dhansiri Reserve Forest. The area experiences tropical monsoon climate. The area falls in the rain-shadow zone of Northeast India. Dhansiri Reserve Forest comprises of Tropical Moist Deciduous and Tropical Semi-evergreen type of forest (Choudhary, 1993). Birdlife International, a global partnership for conservation organization, has recognized Dhansiri Reserve Forest as Important Bird Area.

Field survey was conducted during September 2015 to December 2019 between 8.00 to 16.00h in all seasons i.e., pre-monsoon, monsoon, retreating monsoon and winter. Data of butterfly fauna was collected by random survey. The species were photographed and identified using field guide of Kehimkar (2008) and Sondhi *et al.* (2013). All butterfly species were identified up to species level. No specimen was collected for the study. Classification and nomenclature of butterflies were done according to the website of Indian Butterflies (<https://www.ifoundbutterflies.org>).

RESULTS AND DISCUSSION

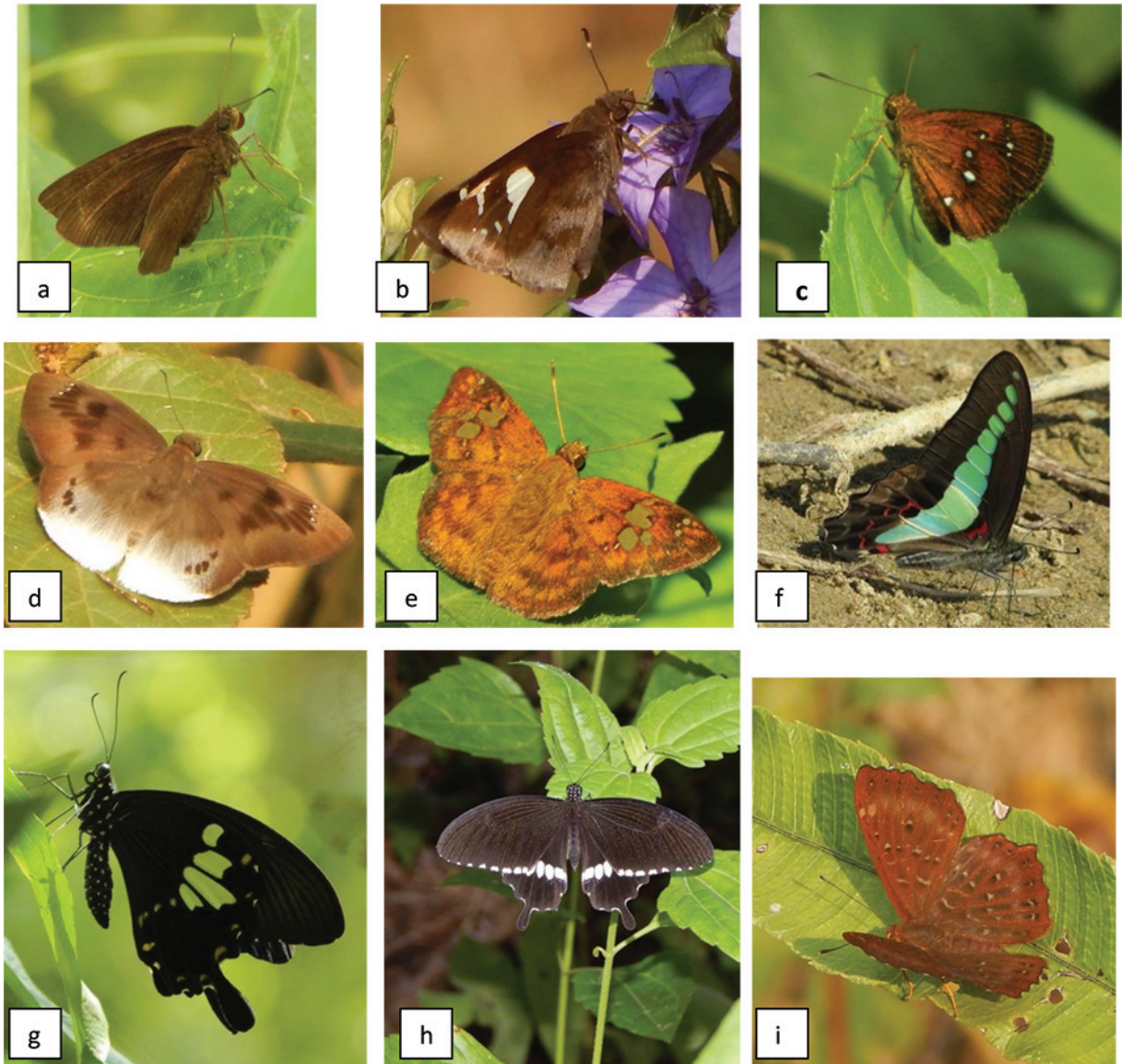
A total of 106 species belonging to six families were

recorded from Dhansiri Reserve Forest (Plate I, II Table 1). Out of 106 species, eight species [*Graphium sarpedon*, *Appias albina*, *Spindasis lohita*, *Charaxes marmax*, *Athyma ranga* and *Tanaecia lepidae*, *Hypolycaena othona* and *Euploea mulciber*] are legally protected under various Schedules of the Indian Wildlife (Protection) Amendment Act (IWLPA Act), 2022 (IWLPA, 2022). Species richness was maximum in the family Nymphalidae comprising of 49 species, followed by Lycaenidae (22 species), Pieridae (16 species), Papilionidae (11 species), Hesperidae (7 species) and Riodinidae (1 species).

Some of the 'rare' species recorded from the Reserve Forest were *Eurema andersonii*, *Appias albina*, *A. galba*, *Charaxes marmax* and *Athyma ranga*. Species which are 'endemic' to Northeastern and Eastern Himalayas viz., *Psolos fuligo*, *Papilio nephelus*, *Gandaca harina*, *Delias descombesi* and *Kaniska canace* were also recorded from the study area. Butterflies *Arhopala eumolphus*, *Appias galba*, *Hypolycaena othona*, *Zizula hylax*, *Ticherra acte* and *Pseudergolis wedah* were very rare and sighted only once during the study period.

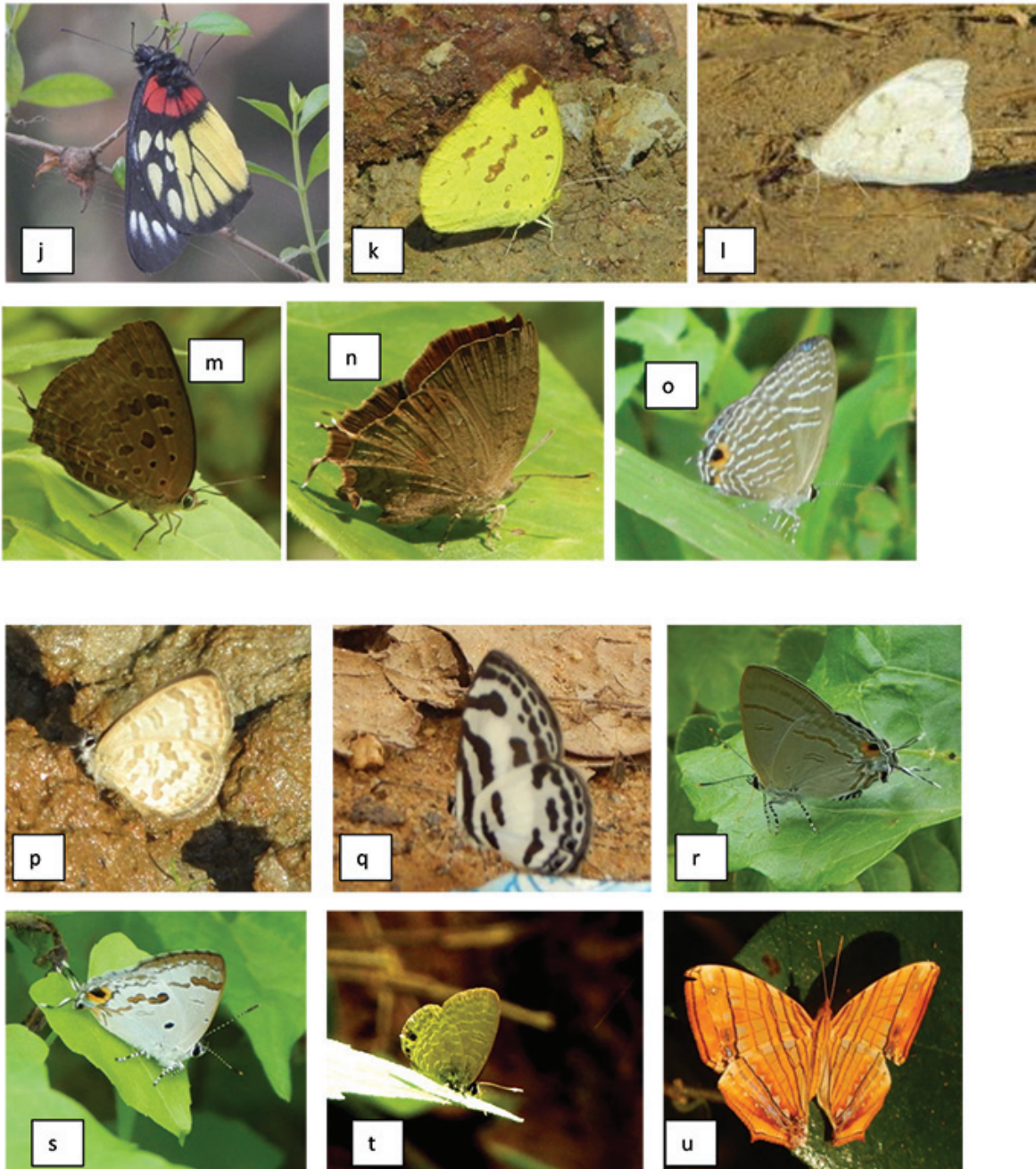
In Nambor–Doigrung Wildlife Sanctuary of North East India, Mudai *et al.* (2015) check listed 224 butterfly species belonging to 137 genera representing five families, of which Nymphalidae was the dominating family with 84 species, followed by 19 species of Papilionidae, 19 Pieridae, 62 Lycaenidae and 40 Hesperidae. Some very important species encountered were *Lasippa viraja viraja*, *Lamproptera curius curius*, *Capila zennara*, *Cupitha purreea* and *Bibasis sena sena*; all are included in the IWLPA. Singh (2020) annotated a list of 375 species of butterflies so far recorded from eastern Assam that includes a large number of very rare species. Bhowmik (2021) recorded 51 butterfly species as additions to the fauna of Tripura, North-east India. In soraipung range of Dehing Patkai National Park, Assam, a total of 92 butterfly species belonging to five families were recorded of which 13 species were listed as protected under various schedules of the IWLPA Act (Gogoi *et al.*, 2023).

Plate I



a. *Psolos fuligo*, b. *Notocrypta curvifascia*, c. *Iambrix salsala*, d. *Tagiades japetus*,
 e. *Sarangesa dasahara*, f. *Graphium sarpedon*, g. *Papilio nephelus*, h. *Papilio polytes*,
 i. *Zemerus flegyas*

Plate II



(j) *Delias pasithoe*, (k) *Eurema blanda*, (l) *Appias indra*, (m) *Arhopala eumolphus*, (n) *Surendra quercetorum*, (o) *Jamides alecto*, (p) *Prosotas nora*, (q) *Discolampa ethion*, (r) *Hypolycaena erylus*, (s) *Hypolycaena othona*, (t) *Nacaduba beroe*, (u) *Chersonesia risa*

Table 1. Check list of butterflies of Dhansiri Reserve Forest

No	Common Name	Scientific Name	Status
Family: Hesperidae			
1	Chestnut Angle	<i>Odontoptilum angulatum</i> (Fedler, 1862)	Not rare
2	Common Small Flat	<i>Sarangesa dasahara</i> (Moore, [1866])	Common
3	Common Snow Flat	<i>Tagiades japetus</i> (Stoll, [1781])	Common
4	Coon	<i>Psolos fuligo</i> (Mabille, 1876)	Common
5	Fulvous Pied Flat	<i>Pseudocoladenia dan</i> (Evan, 1949)	Common
6	Chestnut Bob	<i>Iambrix salsala</i> (Moore, [1866])	Common
7	Restricted Demon	<i>Notocrypta curvifascia</i> (C. & R. Felder, 1862)	Common
Family: Papilionidae			
8	Common Bluebottle *	<i>Graphium sarpedon</i> (Linnaeus, 1758)	Common
9	Great Jay	<i>G. eurypylus</i> (Linnaeus, 1758)	Not rare
10	Common Jay	<i>G. doson</i> (C. & R. Fedler, 1864)	Common
11	Common Mime	<i>Papilio clytia</i> (Linnaeus, 1758)	Common
12	Common Mormon	<i>P. polytes</i> Linnaeus 1758	Common
13	Red Helen	<i>P. helenus</i> Linnaeus 1758	Common
14	Yellow Helen	<i>P. nephelus</i> Boisduval, 1836	Common
15	Great Mormon	<i>P. memnon</i> Linnaeus 1758	Common
16	Common Batwing	<i>Atrophaneura varuna</i> White 1842	Not rare
17	Lime Butterfly	<i>P. demoleus</i> Linnaeus 1758	Very common
18	Common Birdwing #	<i>Troides helena</i> Linnaeus, 1758	Not rare
Family: Pieridae			
19	One Spot Grass Yellow	<i>Eurema andersonii</i> (Moore, 1886). This species is distributed in Andaman Islands only	Rare
20	Three Spot Grass Yellow	<i>E. blanda</i> (Boisduval, 1836)	Common
21	Common Grass Yellow	<i>E. hecabe</i> (Linnaeus, 1758)	Very common
22	Tree Yellow	<i>Gandaca harina</i> (Horsfield, [1829])	Not rare
23	Common Emigrant	<i>Catopsilia pomona</i> (Fabricius, 1775)	Common
24	Mottled Emigrant	<i>C. pyranthe</i> (Linnaeus, 1758)	Common
25	Yellow Orange Tip	<i>Ixias pyrene</i> (Linnaeus, 1764)	Common

26	Chocolate Albatross	<i>Appias lyncida</i> (Cramer, [1777])	Common
27	Common Albatross*	<i>A. albina</i> (Boisduval, 1836)	Rare
28	Orange Albatross	<i>A. galba</i> (Wallace, 1867)	Rare
29	Lesser Gull	<i>Cepora nadina</i> (Lucas, 1852)	Not rare
30	Psyche	<i>Leptosia nina</i> (Fabricius, 1793)	Common
31	Red-base Jezebel	<i>Delias pasithoe</i> (Linnaeus, 1767)	Not rare
32	Red-spot Jezebel	<i>D. descombesi</i> (Boisduval, 1836)	Not rare
33	Plain Puffin	<i>A. indra</i> (Moore, [1858])	
34	Indian Cabbage White	<i>Pieris canidia</i> (Linnaeus, 1768)	Very common
Family: Lycaenidae			
35	Western Centaur Oakblue	<i>Arhopala centaurus</i> (Fabricius, 1775)	Not rare
36	Green Oakblue	<i>Arhopala eumolphus</i> (Cramer, [1780])	Common
37	Common Acacia Blue	<i>Surendra quercetorum</i> (Moore, [1858])	Common
38	Yamfly	<i>Loxura atymnus</i> (Stoll, 1780)	Common
39	Common Tit	<i>Hypolycaena erylus</i> (Godart, [1824])	Not rare
40	Fluffy Tit	<i>Zeltus amasa</i> (Hewitson, 1865)	Common
41	Orchid Tit*	<i>H. othona</i> Hewitson, [1865]	Not rare
42	Long-banded Silverline*	<i>Spindasis lohita</i> (Horsfield, [1829])	Common
43	Purple Sapphire	<i>Heliophorus epicles</i> (Godart, [1824])	Common
44	Common Ciliate Blue	<i>Anthene emolus</i> (Godart, [1824])	Common
45	Common Pierrot	<i>Castalius rosimon</i> (Fabricius, 1775)	Common
46	Banded Blue Pierrot	<i>Discolampa ethion</i> (Westwood, [1851])	Not rare
47	Tailless Lineblue	<i>P. dubiosa</i> (Semper, [1879])	Common
48	Brown Lineblue	<i>Prosotas lutea</i> (Martin, 1895)	Common
49	Dark Grass Blue	<i>Zizeeria karsandra</i> (Moore, 1865)	Common
50	Tiny Grass Blue	<i>Zizula hylax</i> (Fabricius, 1775)	Common
51	Common Lineblue	<i>Prosotas nora</i> (C. Felder, 1860)	Common
52	Slate Flash	<i>Rapala manea</i> (Hewitson, 1863)	Common
53	Blue Imperial	<i>Ticherra acte acte</i> (Moore, [1858])	Not rare
54	Opaque Six-Lineblue	<i>Nacaduba beroe</i> (C. & R. Felder, [1865])	Not rare
55	Transparent Six-Lineblue	<i>N. kurava</i> (Moore, [1858])	Common

56	Metallic cerulean	<i>Jamides alecto</i> (C. Felder, 1860)	Common
Family: Riodinidae			
57	Punchinello	<i>Zemeros flegyas</i> (Cramer, [1780])	Common
Family: Nymphalidae			
58	Glassy Tiger	<i>Parantica aglea</i> (Stoll, [1782])	Common
59	Plain Tiger	<i>Danaus chrysippus</i> (Linnaeus, 1758)	Very common
60	Striped Tiger	<i>D. genutia</i> (Cramer, [1779])	Very common
61	Dark Blue Tiger	<i>Tirumala septentrionis</i> (Butler, 1874)	Not rare
62	Common Crow	<i>Euploea core</i> (Cramer, [1780])	Common
63	Striped Blue Crow*	<i>E. mulciber</i> (Cramer, [1777])	Common
64	Magpie Crow	<i>E. radamanthus</i> (Fabricius, 1793)	Not rare
65	Indian Nawab	<i>Charaxes bharata</i> C & R Felder [1867]	Common
66	Tawny Rajah	<i>C. bernardus</i> (Fabricius, 1793)	Common
67	Yellow Rajah*	<i>C. marmax</i> Westwood, 1847	Rare
68	Common Evening Brown	<i>Melanitis leda</i> (Linnaeus, 1758)	Very common
69	Angled Red Forester	<i>Lethe chandica</i> (Moore, [1858])	Not rare
70	Common Palmfly	<i>Elymnias hypermnestra</i> (Linnaeus, 1763)	Common
71	Common Bushbrown	<i>Mycalesis perseus</i> (Fabricius, 1775)	Very common
72	Dark-branded Bushbrown	<i>M. mineus</i> (Linnaeus, 1758)	Very common
73	Nigger	<i>Orsotriaena medus</i> (Fabricius, 1775)	Common
74	Common Five-ring	<i>Ypthima baldus</i> (Fabricius, 1775)	Very common
75	Common Four-ring	<i>Y. huebneri</i> Kirby, 1871	Very common
76	Leopard Lacewing	<i>Cethosia cyane</i> (Drury, [1773])	Not rare
77	Cruiser	<i>Vindula erota</i> (Fabricius, 1793)	Not rare
78	Large Yeoman	<i>Cirrochroa aoris</i> Doubleday, [1847]	Not rare
79	Common Yeoman	<i>C. tyche</i> C. & R. Felder, 1861	Common
80	Rustic	<i>Cupha erymanthis</i> (Drury, [1773])	Common
81	Vagrant	<i>Vagrans egista</i> (Cramer, [1780])	Not rare
82	Common Leopard	<i>Phalanta phalantha</i> (Drury, [1773])	Common
83	Commander	<i>Moduza procris</i> (Cramer, [1777])	Common
84	Common Sergeant	<i>Athyma perius</i> (Linnaeus, 1758)	Common

85	Blackvein Sergeant*	<i>Athyma ranga</i> Moore, [1858]	Rare
86	Colour Sergeant	<i>A. inara</i> Westwood, 1850	Not rare
87	Common Lascar	<i>Pantoporia hordonia</i> (Stoll, [1790])	Common
88	Common Sailer	<i>Neptis hylas</i> (Linnaeus, 1758)	Very common
89	Short-banded Sailer	<i>Phaedyma columella</i> (Cramer, [1780])	Not rare
90	Plain Sailer	<i>N. cartica</i> Moore, 1872	Not rare
91	Knight	<i>Lebadea martha</i> (Fabricius, 1787)	Not rare
92	Grey Count*	<i>Tanaecia lepidae</i> (Butler, 1868)	Not rare
93	Common Map	<i>Cyrestis thyodamas</i> Doyère, [1840]	Common
94	Common Maplet	<i>Chersonesia risa</i> (Doubleday, [1848])	Not rare
95	Angled Castor	<i>Ariadne ariadne</i> (Linnaeus, 1763)	Common
96	Common Castor	<i>Ariadne merione</i> (Cramer, [1777])	Common
97	Black Prince	<i>Rohana parisatis</i> (Westwood, [1851])	Not rare
98	Common Jester	<i>Symbrenthia lilaea</i> (Hewitson, 1864)	Common
99	Peacock Pansy	<i>Junonia almana</i> (Linnaeus, 1758)	Common
100	Chocolate Pansy	<i>J. iphita</i> (Cramer, [1779])	Common
101	Grey Pansy	<i>J. atlites</i> (Linnaeus, 1763)	Not rare
102	Blue Pansy	<i>J. orithya</i> (Linnaeus, 1758)	Very common
103	Great Eggfly	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	Common
104	Tawny Coster	<i>Acraea terpsicore</i> (Linnaeus, 1758)	Common
105	Blue Admiral	<i>Kaniska canace</i> (Linnaeus, 1763)	-
106	Tabby	<i>Pseudergolis wedah</i> (Kollar, [1844])	Not rare

* Represents species protected under the Indian Wildlife (Protection) Act, 2022

Represents species listed in CITES Appendix I

The present study is a first time investigation to document the baseline data of butterfly fauna Dhansiri Reserve Forest of Karbi Anglong District. Dhansiri Reserve Forest was already recognized as an Important Bird Area. Now, noteworthy record of rare and endemic species from this Reserve Forest, and presence of species legally protected under the IWLA Act, 2022, marks its importance as an area for butterfly conservation. A recent study

stated that forest fragmentation is increasing in Dhansiri Reserve Forest and there is an alteration in forest area due to anthropogenic activities (Chowdhury *et al.*, 2017). Habitat fragmentation and deterioration of habitat quality are considered to be two major threats to biodiversity in recent time (Rosin *et al.*, 2012; Sarma *et al.*, 2012). Butterflies being ecological indicators can be used to monitor any alteration in forest habitat and can

thus play a key role in protection of biodiversity. Therefore, conservation efforts should be taken up in the Reserve Forest towards protection of butterfly fauna and also for conservation of flora and fauna.

ACKNOWLEDGEMENTS

Authors are grateful to the local guides for their assistance during field work. Thankful to the Department of Forest, Assam for their co-operation during the entire field study. Special thanks to Mr. Isaac Kehimkar and Mr. Monsoon Jyoti Gogoi for helping in identification of the butterflies.

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(Received September 06, 2023; revised ms accepted January 10, 2024; published March 31, 2024)