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NOTES ON SOME SKIPPER BUTTERFLIES (LEPIDOPTERA: HESPERIIDAE) FROM PANBARI FOREST AND ITS ADJOINING AREAS, KAZIRANGA-KARBI ANGLONG, UPPER ASSAM, INDIA

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Abstract: The paper deals with a checklist of 137 species of skipper butterfly (Hesperiidae) along with notes on some species from Panbari Forest, Kaziranga, upper Assam, based on survey conducted during March 2008–November 2011. Important sightings include Purple Lancer *Salanoemia fuscicornis*, Red-vein Lancer *Pyroneura niasana burmana* Evans, 1926, Pied Flat *Celaenorrhinus moreana* Evans, 1949 and many *Chaospes*, *Potanthus*, and *Halpe* species.

Keywords: Butterfly, Kaziranga, northeastern India, Panbari, skipper, upper Assam.

The upper Assam region of northeastern India south to the Brahmaputra River Basin (BRB) is dominated by the Karbi Hills in Golaghat-Karbi Anglong District and the Patkai Range in Dibrugarh-Tinisukia District. The Karbi Hills are isolated from the Patkai Range, which extends through Nagaland into the Cachar Hills of southern Assam. The area is deficient in Lepidoptera surveys in the past. There is some mention of Margherita, Sibsagar and Lumding in upper Assam in European literature, but little taxonomic work has been done and there is no mention of Karbi Hills. Existing taxonomic works on skippers are confined to the neighbouring Khasi and Jaintia hills (Swinhoe 1893, 1896; Cantlie 1956), Cachar hills (Wood-Mason & de Niceville 1887) and Manipur

and Naga hills (Tytler 1915b, 1926b).

Methods

Study area: Panbari Forest (PF) lying in the foothills of West Karbi Hills is one of the few remaining woodlands left in Assam. The average altitude of the area is around 90m above sea level, varying from around 85–375 m. Part of the forest falling under Golaghat District is protected under Kaziranga National Park (KNP), the rest comes under Kaziranga-Karbi Anglong District and shares its eastern boundary with Dollamora Proposed Reserve Forest (RF) of Kaziranga-Karbi Anglong (Fig. 1).

The area has many *Halpe* sp. and *Potanthus* sp., which require dissection of genitalia for identification. These groups have been well studied in Manipur and Naga Hills (Tytler 1915b) and Khasi and Jaintia hills (Cantlie 1956), but most other areas of the northeastern hills remain poorly surveyed.

This study was conducted during the period of March 2008 to November 2011 in Panbari Forest, adjoining to Karbi Hills and its neighbouring areas. The complex species were identified on the basis of published literature W.H. Evans (1932, 1949), B.A. Pinratana (1985) and Corbet & Pendlebury (1992). *Halpe* sp. and

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Figure 1. Map showing Upper Assam and South Assam

Potanthus sp. need examination of male genitalia to confirm identity, and due to lack of permission this could not be done.

Results

A total of 137 species were encountered (Table 1). Important sightings include Purple Lancer *Salanoemia fuscicornis*, Red-vein Lancer *Pyronura niasana burmana* Evans, 1926, Pied Flat *Celaenorrhinus moreana* Evans, 1949 etc., and lots of *Choaspes* sp., *Potanthus* sp. and *Halpe* sp. The Pied Flat *Celaenorrhinus moreana* record was interesting because its known only from one specimen collected by Tytler (1915b) from Manipur, which was later described by Evans in 1949.

Notes on selected species/genus

Branded Awlking *Choaspes plateni stigmata* Evans, 1932 (Images 1–2): The species was encountered a few times in PF. The main identification key of this species is that the orange tornus on the underside of the wing extends to V3 and continues over the vein. The male is basally dark iridescent green from above, rest indigo blue and female is paler from upperside.

Range: It is distributed in Sikkim, Assam, northern Thailand, Laos, Vietnam, China, Hainan.

***Choaspes plateni caudata* Evans, 1932 (Images 3–4):** One female was encountered on 23 September 2008.

Another male was encountered on 02 July 2009. The tornal area is yellow and the yellow area reaches V3. It has not been reported from northeastern India and is placed under *C. stigmata* as a subspecies (Evans 1932).

Range: It is known to occur from southern Myanmar, Thailand, western Malaysia, Singapore, Borneo, Sumatra, Nias, Bangka and is placed under *C. stigmatus* as taxon *caudatus* (Inayoshi 1996–2011).

Indian Awlking *Choaspes benjaminii japonica* Murray, 1875 (Images 5–6): One male was encountered mud-puddling on a rainy day on 30 August 2008. The species was found flying in PF on many occasions. The species is dark shining indigo blue in new specimens on the upper side of forewing in male, whereas in female, the upper side is dark shining green bases iridescent. Underside of the wing, the tornal orange area does not reach V3 and never near V3.

Range: It is known to occur from western Himalayas, Nepal, Sikkim, Assam, Myanmar, Thailand, Laos, Vietnam, China, Formosa, Palawan.

Hooked Awlking *Choaspes hemixanthus furcata* Evans, 1932 (Images 7–8): On 20 September 2008, one individual was encountered. The species can be differentiated from *C. benjaminii japonica* in having the basal half dark olive green on the upper side of forewing and outer part brown washed indigo, in male and female, they are paler and brighter. In the male of

C. benjamii japonica, the upper side of forewing is dark shining indigo blue, but old specimens turn green. On the underside of the wing, the tornal orange area does not reach V3, but sometimes reaches near V3.

Range: The species is known to occur from Nepal, Sikkim, Assam, Myanmar, Thailand, Laos, Vietnam, Hainan, China, western Malaysia, Palawan.

Large Banded Awl *Hasora khoda coulteri* Wood Mason & De Nicéville, 1887 (Image 9): The species has been recorded from Cachar, Assam of northeastern India. One male and female were sighted during field study. The species differ from *H. taminatus* in having a straight postdiscal band on the forewing, whereas in the latter the post discal band is curved inward at costa.

Range: It is known to occur from Assam, Myanmar, Andamans, Thailand (Inayoshi 1996–2011).

Slate Awlet *Bibasis mahintha* Moore, 1866 (Image 10): One individual, probably a female was encountered in PF. The specimen encountered was pale brown. The species was seen also another time in flight. The species is reported from Silcuri, Cachar of northeastern India (Wood-Mason & de Nicéville, 1887). The species is recorded from Sebung, Manipur in fair numbers but reported not common (Tytler 1915b).

Range: Assam-Manipur, Burma.

Pied Flat *Celaenorrhinus moreana* Evans, 1949 (Image 11): The species was recorded only once from PF. The species was first collected from Saitu, Manipur and was thought to be possibly *C. sumitra* but did not have the orange discal spots on the upper side hind wing in Moore's type specimen which was checked by Major W.H. Evans (Tytler 1915b). Other than this, there is no record of the species from northeastern India or any other place. This is probably the second record of the species.

Range: Manipur, Assam

Olive Flat *Chamunda chamunda* Moore, 1866 (Image 12): This species was previously placed under *Celaenorrhinus* is now placed under a new genus *Chamunda* Evans, 1949. The species matches the figure of Lepidoptera Indica Volume 10, but differs in having brown cilia instead of yellow-brown cilia. The species has no spots on the hind wing. The species is reported very common in Sebung, Manipur during March, April and June (Tytler 1915b).

Range: The species is distributed in Sikkim, Myanmar, Thailand, Laos, Malay Peninsula. The species is reported from Sylhet, Sikkim, Assam, Naga Hills (Swinhoe 1912–1913).

Swinhoe's Flat *Celaenorrhinus zea* Swinhoe, 1909 (Image 13): The species was encountered around 10

times in PF. Also, it was encountered from Khalingduar RF of Manash Biosphere Reserve, north bank of Brahmaputra River basin. It is a rare species (Swinhoe 1912–1913).

Range: The species is distributed from Sikkim-Assam-Burma (Evans 1949).

Purple Lancer *Salanoemia fuscicornis* Elwes & Edwards, 1897 (Image 14): The species is so far known to occur only in southern Assam Hills of northeastern India. *Salanoemia fuscicornis* was recorded from Cachar and northeastern India (de Nicéville 1887). The specimen from Cachar was however confused to be *S. submaculata*. The species was not rare in PF. The species recorded from PF is interesting because Karbi Anglong and Cachar are the oldest forests in northeastern India and there is no record from any other locality. The specimens qualify to be *S. fuscicornis* as antenna is white ringed mid club (Evans 1932), while antenna is yellow ringed mid club in *S. sala*. The key to the identification of the male individuals is the upper side forewing with one or two sub-apical spots (Jong 2006). The specimens encountered in PF lacks sub-apical spots on the underside of the wing. It could be due to the fact that subapical spots of upper side may not be visible on underside of the wing.

Range: The species distribution range is from Cachar of Assam to S. Burma, Malaya, Siam, Pulo Laut (Evans 1932).

Red-vein Lancer *Pyronera niasana burmana* Evans 1926 (Image 15): On the underside of hind wing, the veins are red in this species and upper side of hind wing, tornus dark brown and on the upper side of forewing, cell spots one above the other, lower hardly produced towards the base (Evans 1932). But, in the specimen encountered the tornus was yellow instead of brown. The species has been recorded only from Cachar, Assam in northeastern India. Cantile (1956) reports *P. callineura* from Khasi Hills which is probably *P. niasana burmana*. The species was encountered twice in PF during the course of study.

Range: The species is distributed in Assam, Myanmar, Thailand, Langkawi, Malaysia, Borneo, Sumatra, Palawan.

Yellow-vein Lancer *Pyronera margherita* Doherty, 1889 (Image 16): The species was common in PF although reported very rare (Evans 1932). One male from Margherita (type locality) and similar one from Sadia (the only record of the species from northern bank of River Brahmaputra) was collected by Doherty (Swinhoe 1912–1913). However, the species is recently reported from Pakhui TR of eastern Arunachal

Pradesh, another record from northern bank (<http://www.ifoundbutterflies.org/309-pyroneura/pyroneura-margherita>). The species is reported from Irang River, Manipur (Tytler 1915b). The species is probably absent in Khasi Hills, Meghalaya (the most studied area from northeastern India) as the species is not reported by Swinhoe (1912–1913), Cantile (1956). The species is sighted from Namdapha, western Arunachal Pradesh (Kehimkar 2008). I personally saw the species few times at Jeypore RF, upper Assam, during 2011. The identification key of the species is yellow veins on the underside of hind wing and cell spots conjoined or nearly so (Evans 1932).

Range: The species is distributed from eastern Arunachal Pradesh-upper Assam and western Arunachal Pradesh-Tenasserim.

Yellow-band Palmer *Lotongus sarala sarala* De Nicéville, 1889 (Image 17): The species was sighted around 20 times during the course of the study and is not rare in PF. The subspecies is only reported from Khasi Hills (Swinhoe 1912–1913) and rare (Evans 1932). The species is however reported from Gasapani, Naga hills at 518m and very rare (Tytler 1915b). There is no present sighting of the species in northeastern India.

Range: Assam, Meghalaya (subspecies *sarala*), Bhamo (subspecies *conjuncta*), western China, Tonkin (subspecies *chinensis*), Hainan (subspecies *quinquepunctata*).

Malay Forest Bob *Scobura phidita* Hewitson, 1886 (= *martini*) (Images 18–19): The species was recorded only once in PF. This is the second record of the species from upper Assam, first sighted from Jeypore RF by the author. However, both the races seem to be quite different. The species has also been reported from Nichuguard of Nagaland and western Manipur (Tytler 1915b). The species is also reported from Khasi Hills (Cantile 1956) and since the previous works do not mention the species in Khasi Hills, it appears to be very rare. The identification key of the species can be differentiated from *S. cephalo* in spot in 4 absent on upper side of forewing. Underside of hind wing spots black edged and often a discal row of black spots and two spots in cell also black (Evans 1932). The species recorded in PF exactly matches Evans's description, whereas in the specimen that was encountered by the author in Jeypore RF, discal row of black spots on the underside of hind wing were absent.

Range: The species occurs in the southern bank of Brahmaputra River basin. The species is reported from Khasi Hill-Manipur-Myanmar, Malay Peninsula, Sumatra and Borneo.

Forest Bob *Scobura cephalo* Hewitson, 1876 (Image 20): The species was seen more than 20 times in PF. The species was also seen in degraded forest of Dollamora. The species is not rare in northeastern India. On the upper side of forewing, there is a spot in space 4. On the underside of hind wing, there may be 3 small white spots in 1c, 3 and 6 (absent in the specimen) against the larger spot in 2, 4–5, which are often chestnut edged. In the female, the chestnut colour is very pronounced and occupies the whole area from the spots to tremens and also on the apex of forewing. The species is very similar to *S. isota* but can be distinguished by the present of a conspicuous rectangular spot in space 1 on underside of hind wing (Jong 2006).

Range: The species is distributed from Sikkim to Burma, Malay Peninsula, Sumatra and Borneo.

Large Forest Bob *Scobura cephalo* De Nicéville, 1888 (Image 21): The species was sighted more than 15 times in PF. The species was seen at Dollamora. The species have basal half yellow and outer half chestnut and small dark ringed white spots in 1c, 2, 3, 5, 6 and sometimes dark spot base 7 on the underside of hind wing (Evans 1932). But, in the specimens of PF and also in Jeypore RF of Assam, an extra spot in space 7 was found by the author; on the contrary, in the specimens recorded by the author from Mishmi Hills, the basal spot in 7 as well as the discal spot in space 7 were both absent. The species is not rare in northeastern India.

Range: The species is distributed from Sikkim to Burma, Tonkin, Hainan. Subspecies *S. cephalo* *kinka* Evans, 1949 occurs in China (Fan et al. 2010).

Purple Spotted Flitter *Zographetus ogygia ogygia* Hewitson, 1886 (Image 22): The species was seen more than 10 times in 4–5 October 2008. The species was not seen in other seasons after that. The species bears a prominent discal row of purple brown spots in 1–7 and mid-cell and the subspecies is extremely variable in size, colour of underside, and spots of underside hind wing, which are usually large and diffused (as in the specimen), but may be separate and sharply defined (Evans 1932).

Range: It is distributed in Sikkim to Myanmar, Thailand, Laos, Langkawi, Malaysia, Tioman, Singapore, Borneo, Sumatra, Nias, Banka, Java.

Redeyes *Matapa* spp.: Five species of *Matapa* were recorded during the field study. Identification of *Matapa* was based on the keys of Jong (1983) based on male sex brand and other morphological characters. These are: (i) Common Redeye *Matapa aria* Moore, 1866, (ii) Purple Redeye *Matapa purpurascens* Elwes & Edwards, 1897, (iii) Dark-brand Redeye *Matapa druna* Moore, 1866, (iv) Black-veined Redeye *Matapa sasivarna* Moore, 1866,

Table 1. A preliminary checklist of skippers recorded in Panbari Forest of Kaziranga and neighbouring areas of Karbi Hills (2008–2012)

Family: Hesperidae		Comments
1	Common Awl <i>Hasora badra</i> Moore, 1858	Occurs in Panbari and woodlands of Bokakhat
2	Plain Banded Awl <i>Hasora vitta vitta</i> Butler, 1870	Seen about four times
3	Large Banded Awl <i>Hasora khoda coulteri</i> Wood-Mason & de Nicéville, 1887	One male and another female seen
4	White-banded Awl <i>Hasora taminatus bhavara</i> Fruhstorfer, 1911	Seen in woodlands of Bokakhat, Dollamora
5	Common Banded Awl <i>Hasora alexis</i> Fabricius, 1775	Not rare, seen in small woodlands also
6	Brown Awl <i>Badamia exclamations</i> Fabricius, 1775	Seen only once
7	Branded Orange Awlet <i>Bibasis oedipodea aegina</i> Plötz, 1884	Seen in Panbari and woodlands of Bokakhat
8	Orange Awlet <i>Bibasis harisa</i> Moore, 1865	One seen in a hill stream
9	Slate Awlet <i>Bibasis mahintha</i> Moore, 1866	Seen twice in Panbari
10	Small Green Awlet <i>Bibasis amara</i> Moore, 1866	Seen in Panbari and Kohora
11	Pale Green Awlet <i>Bibasis gomata</i> Moore, 1865	One dead specimen encountered
12	Orange-tail Awl <i>Bibasis sena uniformis</i> Elwes & Edwards, 1897	One seen under a leaf in Panbari
13	Indian Awlking <i>Choaspes benjaminii japonica</i> Murray, 1875	Seen once at Panbari
14	Branded Awlking <i>Choaspes plateni stigmata</i> Evans, 1932	Seen many times at Panbari
15	<i>Choaspes plateni caudata</i> Evans, 1932	Seen many times at Panbari
16	Hooked Awlking <i>Choaspes hemixanthus furcata</i> Evans, 1932	Seen many times at Panbari
17	<i>Chamunda chamunda</i> Moore, 1866	Seen three times at Panbari
18	Swinhoe's Flat <i>Celaenorrhinus zea</i> Swinhoe, 1909	Seen about 10 times in Panbari
19	Pied Flat <i>Celaenorrhinus moreana</i> Evans, 1949	Seen once in Panbari
20	Dark Yellow Banded Flat <i>Celaenorrhinus aurivittata</i> Moore, 1879	Not rare in Panbari
21	Large Snow Flat <i>Tagiades gana</i> Moore, 1866	Not rare
22	Suffused Snow Flat <i>Tagiades japetus obscurus</i> Mabille, 1876	Common but occurs only in forest
23	Common Snow Flat <i>Tagiades japetus ravi</i> Moore, 1866	Common and occurs in villages also
24	Spotted Snow Flat <i>Tagiades menaka</i> Moore, 1866	Seen twice at Panbari
25	Water Snow Flat <i>Tagiades litigiosa</i> Möschler, 1878	Occurs in woodlands of Bokakhat, common at Panbari
26	Yellow Flat <i>Mooreana trichoneura pralaya</i> Moore, 1865	Not rare in Panbari, also seen in Kanchanjuri
27	Dusky Yellow-breast Flat <i>Gerosis phisara</i> Moore, 1884	Common at Panbari, Dollamora
28	Fulvous Pied Flat α <i>Pseudocoldaenia dan faith</i> Kollar β . <i>dhyana</i> Fruhstorfer, 1909	Very common species
29	Sikkim White Flat <i>Seseria sambara</i> Moore, 1865	Seen about six times at Panbari
30	Himalayan White Flat <i>Seseria dohertyi</i> Watson, 1893	Seen once at Panbari
31	Chestnut Angle <i>Odontoptilum angulata</i> Felder, 1862	Not rare in occurrence
32	Grey Pied Flat <i>Coladenia laxmi laxmi</i> de Nicéville, 1889	Seen a few times at Panbari
33	Brown Pied Flat <i>Coladenia agni</i> de Nicéville, 1883	Nor rare in occurrence but seen only in one area regularly at Panbari
34	Elwes Pied Flat <i>Coladenia agnioides</i> Elwes & Edwards 1897	Seen once in Panbari
35	Common Small Flat <i>Sarangesa dasahara</i> Moore, 1865	Occurs un urban areas
36	Indian Skipper <i>Spialia galba</i> Fabricius, 1793	Occurs in forest edges, very common
37	Tiger Hopper <i>Ochus subvittatus subradiatus</i> Moore, 1878	One seen by Gaurab Nandai Das in Bokakhat
38	Giant Hopper <i>Apostictopterus fuliginosus</i> Leech, 1893	One seen at Numaligarh RF
39	Forest Hopper <i>Asticopterus jama olivascens</i> Moore, 1878	Occurs in open edges of forest
40	Bush Hopper <i>Ampittia dioscorides</i> Fabricius, 1793	Occurs in open edges of forest and grasslands, very common at Dollamora
41	Scarce Bush Hopper <i>Ampittia maroides</i> de Nicéville, 1896	Seen few times at Kakochang, Dollamora
42	Blue-spotted Scrub Hopper <i>Aeromachus kali</i> de Nicéville, 1885	One seen at Kakochang and another at Bokakhat
43	<i>Aeromachus stigmata obsoleta</i> Moore, 1878	Common in villages
44	<i>Aeromachus jhora creta</i> Evans, 1949	Common in the paddy field areas of Kohora
45	Pigmy scrub Hopper <i>Aeromachus pygmaeus</i> Fabricius, 1775	Seen few times at Numaligarh RF
46	Chestnut Bob <i>Iambrix salsala</i> Moore, 1865	Very common
47	Indian Palm Bob <i>Suastus gremius gremius</i> Fabricius, 1878	Seen only once at Panbari
48	Small Indian Palm bob <i>Suastus minuta aditia</i> Evans, 1943	Seen many times at Panbari

Family: HesperIIDae		Comments
49	Forest Bob <i>Scobura cephalis</i> Hewitson, 1876	Commonly seen in Panbari, also seen in Kanchanjuri
50	Khasi Forest Bob <i>Scobura isota</i> Swinhoe, 1893	Seen few times at Dollamora
51	Malay Forest Bob <i>Scobura phiditia</i> Hewitson, 1866	Seen once at Panbari
52	Large Forest Bob <i>Scobura cephaloides</i> de Nicéville, 1889	Not rare, seen in Panbari and Dollamora
53	Narrow-banded Velvet Bob <i>Koruthaialos rubecula cachara</i> Evans, 1949	Not rare in the hill streams of Panbari
54	Dark Velvet Bob <i>Koruthaialos butleri butleri</i> De Nicéville, 1883	Common in Panbari
55	Bright Red Velvet Bob <i>Koruthaialos xanites gapaka</i> Fruhstorfer, 1910	Seen only once at Panbari
56	Coon <i>Psolas fuligo subfasciatus</i> Moore, 1879	Occurs in degraded areas and villages
57	Watson's Demon <i>Stimula swinhoei</i> Elwes & Edwards, 1897	Seen in open spaces of Panbari and villages of Bokakhat
58	Chocolate Demon <i>Ancistroides nigrita diocles</i> Moore, 1866	Very common
59	Grass Demon <i>Udaspes folus</i> Cramer, 1775	Occurs in urban areas
60	<i>Notocrypta quadrata</i> Elwes & Edwards, 1897	Seen twice at Panbari
61	Common Banded Demon <i>Notocrypta paralysos volux</i> Mabille 1883 β. <i>asawa</i> Fruhstorfer, 1911	Common species
62	Restricted Demon <i>Notocrypta curvifascia</i> C. & R. Felder, 1862	Common in Panbari, Dollamora. Also seen in Numaligarh
63	Giant Redeye <i>Gangara thyrasis thyrasis</i> Fabricius, 1775	Occurs everywhere
64	Palm Redeye <i>Erionota thrax thrax</i> Linnaeus, 1767	Seen once at Bokakhat
65	Common Redeye <i>Matapa aria</i> Moore, 1866	Very common species
66	Purple Redeye <i>Matapa purpurascens</i> Elwes & Edwards, 1897	Occurs in Panbari, woodlands of Bokakhat and also seen at Numaligarh
67	Dark-brand Redeye <i>Matapa druna</i> Moore, 1866 / Grey-brand Redeye <i>Matapa shalgrama</i> De Nicéville, 1883	Seen few times at Panbari
68	Black-veined Redeye <i>Matapa sasivarna</i> Moore, 1866	Not rare at Panbari, also seen in Dollamora
69	Fringed Redeye <i>Matapa cresta</i> Evans, 1949	Seen twice at Panbari, both female, need further confirmation
70	Tree Flitter <i>Hyarotis adrastus prabus</i> Moore, 1886	Occurs in urban areas
71	Purple and Gold Flitter <i>Zographetus satwa</i> de Nicéville, 1884	Occurs in Panbari, Numaligarh RF
72	Purple spotted Flitter <i>Zographetus ogygia ogygia</i> Hewitson, 1866	Seen many times at Panbari but very seasonal
73	<i>Zographetus rama rama</i> Mabille, 1876	Seen of few times at Panbari
74	Red-Vein Lancer <i>Pyroneura niasana burmana</i> Evans, 1926	Seen twice at Panbari
75	Yellow-vein Lancer <i>Pyroneura margherita</i> Doherty, 1889	Not rare at Panbari
76	Purple Lancer <i>Salanoemia fuscicornis</i> Elwes & Edwards, 1897	Seen many times at Panbari but very seasonal
77	White Tipped Palmer <i>Lotongus calathus zalates</i> Mabille, 1893?	Seen only once at Panbari. A very blurry photo captured in camera which matches with this species.
78	Yellowband Palmer <i>Lotongus sarala sarala</i> De Nicéville, 1889	Seen many times at Panbari
79	Dark straw Ace <i>Pithauria murdava</i> Moore, 1866	Seen rarely in Panbari
80	Light Straw Ace <i>Pithauria stramineipennis</i> Wood-Mason & de Nicéville, 1887	Commonly seen in open edges of forest
81	Branded Straw Ace <i>Pithauria marsena</i> Hewitson, 1866	Seen few times at Panbari
82	Northern Spotted Ace <i>Thoressa cerata</i> Hewitson, 1876	Seen once at Panbari
83	Olive Ace <i>Thoressa fusca fusca</i> Elwes, 1892	Seen once at Panbari
84	White-fringed Ace <i>Halpe insignis</i> Distant, 1886	Seen once in a woodland of Bokakhat
85	Pale Marked Ace <i>Halpe hauxwelli</i> Evans, 1937	Seen twice at Panbari
86	Moore's Ace <i>Halpe porus</i> Mabille, 1877	Occurs in villages too
87	Indian Ace <i>Halpe homolea aucma</i> Swinhoe, 1893	Common in hill streams of Panbari. Females were seen in forested streams at Dollamora
88	Tenasserim /Hill Ace <i>Halpe kusala</i> ? Fruhstorfer, 1911	Most common <i>Halpe</i> species. Further confirmation required.
89	Confusing Ace <i>Halpe wantona</i> Swinhoe, 1893 (= <i>confusa</i> Evans, 1932, Manipur)	Seen many times at Panbari
90	Couple Ace <i>Halpe flava</i> Evans, 1926	Seen 3 times at Panbari
91	<i>Halpe zola</i> Evans, 1937	Common in hill streams of Panbari, Dollamora
92	Banded Ace <i>Halpe zema</i> Hewitson, 1877	Seen once at Panbari
93	Knyvett's Ace <i>Halpe knyveti</i> Elwes & Edwards, 1897 / Tytler's Ace <i>Halpe tytleri</i> Evans, 1932	Seen few times at Panbari

Family: HesperIIDae		Comments
94	Sikkim Ace <i>Halpe sikkima</i> Moore, 1882	Seen once mud-puddling in Panbari
95	<i>Halpe arcuata</i> Evans, 1937	Seen once at Panbari
96	Wax Dart <i>Cupitha purrea</i> Moore, 1877	Seasonally common
97	Common Dartlet <i>Oriens gola</i> Moore, 1877	Very common species and occurs in urban areas also
98	Branded Dart <i>Potanthus rectifasciata rectifasciata</i> Elwes & Edwards, 1897	Seen once at Panbari
99	Common Dart <i>Potanthus pseudomaesa clio</i> Evans, 1932	Seen twice in Panbari
100	Burmese Dart <i>Potanthus juno</i> Evans, 1932	Seen twice at forest of Panbari, once a male , another time a female
101	Sikkim Dart <i>Potanthus nesta</i> Evans, 1934	Seen two times at Panbari
102	Palni Dart <i>Potanthus palnia palnia</i> Evans, 1914	Seen few times at Panbari
103	Broad Bident Dart <i>Potanthus trachala tytleri</i> Evans, 1914	The species was seen about 10 times in a hill stream of Panbari
104	Pallid Dart <i>Potanthus pallida</i> Evans, 1932	The species was seen once at Panbari
105	Narrow Bident Dart <i>Potanthus mingo ajax</i> Evans, 1932	Seen few times at Panbari
106	Chinese Dart <i>Potanthus confucius dushta</i> Fruhstorfer, 1911	The species occurs in Panbari as well as small woodlands of Bokakhat Seen once at Dollamora and once at Panbari
107	Assam Dart <i>Potanthus lydia lydia</i> Evans, 1934	Seen once at Panbari
108	Sumatran Dart <i>Potanthus ganda ganda</i> Fruhstrofer, 1911	Seen many times at Panbari, male and female together
109	Yellow Dart <i>Potanthus flavaalcon</i> Evans, 1932	Seen once at Kohora
110	<i>Potanthus sita</i> Evans, 1932	Seen few times in a hill stream of Panbari
111	Common Palm Dart <i>Telicota colon</i> Fabricius, 1775	Seen in Panbari and woodlands of Bokakhat. In Panbari, the species was found in hill streams. Was found to bask in the sun.
112	Dark Palm Dart <i>Telicota bambusae</i> Moore, 1878	Males were seen a few times in hill streams of Panbari. Was found to bask in the sun. Females were seen in the forest.
113	Dark Palm Dart <i>Telicota ohara jix</i> Evans, 1949	The species was seen few times in Panbari forest, was found fond of shady areas, never opened their wing
114	Besta Palm Dart <i>Telicota besta bina</i> Evans, 1949	Males were seen visiting hill streams at Panbari
115	Greenish Palm Dart <i>Telicota ancilla horisha</i> Evans, 1934	Males were seen few times mud-puddling and basking in the hill streams of Panbari
116	Linna Palm Dart <i>Telicota linna linna</i> Evans, 1949	Seen few times at Panbari
117	Plain Palm Darts <i>Cephrenes acalle</i> Hopffer, 1874	Commonly seen in the woodlands of Bokakhat
118	Common Wight <i>Iton semamora semamora</i> Moore, 1866	One seen by Bitupon Boruah in Kohora in November
119	Paintbrush Swift <i>Baoris farri</i> Moore, 1878	Common in Panbari
120	Small Paintbrush Swift <i>Baoris penicillata chapmani</i> Evans, 1937	Seen sometimes at Panbari
121	Figure of 8 Swift <i>Caltoris pagana</i> De Niceville, 1887	Rare in Panbari, once seen near a hill stream
122	Yellow Fringed Swift <i>Caltoris aurociliata</i> Elwes & Edwards, 1897	Commonly seen in the woodlands of Bokakhat, seen rarely at Panbari
123	Sirius Swift <i>Caltoris sirius</i> Evans, 1926	Not rare in Panbari
124	Colon Swift <i>Caltoris bromus</i> Leech, 1894	Not rare
125	Colon Swift <i>Caltoris cara</i> Evans, 1932	Not rare
126	Full stop Swift <i>Caltoris moolata</i> Moore, 1878	A female seen at Dollamora
127	Tufted Swift <i>Caltoris plebeia</i> de Nicéville, 1887	Seen few times in a woodland of Bokakhat
128	Blank Swift <i>Caltoris kumara moorei</i> Evans, 1926	Seen on Panbari and also in paddy fields of Kohora
129	Phillipine Swift <i>Caltoris philippina belli</i> Evans, 1932	Seen few times in the woodlands of Bokakhat
130	Contiguous Swift <i>Polytremis lubricans</i> Herrich-Schäffer, 1869	Commonly seen everywhere
131	Great Swift <i>Pelopidas assamensis</i> de Nicéville, 1882	Occurs on degraded forest
132	Conjoined Swift <i>Pelopidas conjuncta javana</i> Mabille, 1877	Not rare
133	Large Branded Swift <i>Pelopidas sinensis</i> Mabille, 1877	Very common species
134	Small Branded Swift <i>Pelopidas mathias</i> Fabricius, 1798	Very common species
135	Straight Swift <i>Parnara guttatus</i> Bremer & Grey, 1852	Common everywhere
136	Ceylon Swift <i>Parnara bada</i> Moore, 1878	Common species
137	Bevan's Swift <i>Pseudoborbo bevani</i> Moore, 1878	Seen twice in Panbari



Image 1. *Choaspes plateni stigmata* Evans, 1932 (male)



Image 2. *Choaspes plateni stigmata* Evans, 1932 (male - upper side)



Image 3. *Choaspes plateni caudata* Evans, 1932 (male)



Image 4. *Choaspes plateni caudata* Evans, 1932 (female)



Image 5. *Choaspes benjaminii japonica* Murray, 1875



Image 6. *Choaspes benjaminii japonica* Murray, 1875 (upper side)



Image 7. *Choaspes hemixanthus furcata* Evans, 1932



Image 8. *Choaspes hemixanthus furcata* Evans, 1932 (upper side)



Image 9. *Hasora khoda coulteri* Wood Mason & De Nicéville, 1887 (female)



Image 10. *Bibasis mahintha* Moore, 1866



Image 11. *Celaenorrhinus moreana* Evans, 1949



Image 12. *Chamunda chamunda* Moore, 1866



Image 13. *Celaenorrhinus zea* Swinhoe, 1909



Image 14. *Salanoemia fuscicornis* Elwes & Edwards, 1897



Image 15. *Pyroneura niasana burmana* Evans, 1926



Image 17. *Lotongus sarala sarala* De Nicéville, 1889



Image 16. *Pyroneura margherita margherita* Dohertyi, 1889



Image 18. *Scobura phidita* Hewitson, 1886



Image 19. *Scobura phidita*
Hewitson, 1886 (upper side)



Image 20. *Scobura cephalis*
Hewitson, 1876 (= *isota*)



Image 21. *Scobura cephaloides*
cephaloides De Nicéville, 1888



Image 22. *Zographetus ogygia*
ogygia Hewitson, 1886

(v) Fringed Redeye *Matapa cresta* Evans, 1949. All these five species were previously reported from Khasi Hills (Cantile 1956). *Matapa aria* was found abundant everywhere. *Matapa purpurascens* could be found in village woodlands of Bokakhat. Others were found in primary forests of Panbar and Dollamora.

Darts *Potanthus* spp.: A total of 13 Darts were identified based on identification keys of Evans (1932), Evans (1949), Pinratana (1985) and Corbet & Pendlebury (1992). However, identification of *Potanthus* species are challenging and need dissection of genitalia for confirming the species. Earlier taxonomic work on *Potanthus* is well studied from Khasi Hills with 11 species (Cantile 1956). Species they were recorded during field study were possibly : (i) Branded Dart *Potanthus rectifasciata rectifasciata* Elwes & Edwards, 1897, (ii) Pallid Dart *Potanthus pallida* Evans, 1932, (iii) Broad Bident Dart *Potanthus trachala tytleri* Evans, 1914, (iv) Common Dart *Potanthus pseudomaesa clio* Evans 1932, (v) Burmese Dart -*Potanthus junio* Evans 1932, (vi) Sita Dart *Potanthus sita* Evans, 1932 (vii) Yellow Dart *Potanthus flavaalcon* Evans, 1932, (viii) Chinese Dart *Potanthus confucius dushta* Fruhstorfer, 1911, (ix) Sikkim Dart *Potanthus nesta* Evans, 1934, (x) Narrow Bident Dart *Potanthus mingo ajax* Evans, 1932, (xi) Assam Dart *Potanthus lydia lydia* Evans, 1934, (xii) Sumatran Dart *Potanthus ganda ganda* Fruhstorfer, 1911, (xiii) Palni Dart *Potanthus palnia palnia* Evans, 1914.

Aces *Thoressa/Halpe* spp.: Lots of *Halpe* spp. were encountered during field study. However, they need dissection of male genitalia for confirming their identity. Moreover, more taxonomic work is needed in this group from northeastern India. The following species were identified on the basis of identification keys: (i) White-fringed Ace *Halpe insignis* Distant, 1886, (ii) Moore's Ace *Halpe porus* Mabille, 1877, (iii) Indian Ace *Halpe homolea*, (iv) Overlapped Ace *Halpe arcuata* Evans, 1937, (v) Tenasserim/Hill Ace *Halpe kusala* Fruhstorfer,

1911?, (vi) Confusing Ace *Halpe wantona* Swinhoe, 1893, (vii) Banded Ace *Halpe zema*, (viii) *Halpe zola* Evans, 1937, (ix) Knyvett's Ace *Halpe knyveti* Elwes & Edwards, 1897, (x) Sikkim Ace *Halpe sikkima* Moore, 1882 and (xi) Pale Marked Ace *Halpe hauxwelli* Evans, 1937. Out of these, *Halpe burmana* is only reported from Manipur of northeastern India (Tytler 1915b). Two *Thoressa* species were recorded: (i) Northern Spotted Ace *Thoressa cerata* Hewitson, 1876 and (ii) Olive Ace *Thoressa fusca fusca* Elwes, 1892

Discussions

Purple Lancer *Salanoemia fuscicornis*, which was reported previously from Cachar of northeastern India, was sighted approximately 200km away from Panbari. This record of the species is significant because between Cachar and Panbari there lay two hill ranges: Karbi Anglong (Karbi Hills) and North Cachar Hills. The species should also be present all along the inaccessible Karbi Hills but is presumed to be absent from North Cachar Hills due to high altitude. The species should also be absent in the northern bank of Brahmaputra, as the basin is a barrier for many Malayan species of butterflies. The species is only reported from Panbari, Kaziranga of upper Assam and hence the distribution pattern is very interesting. The species is probably absent in other parts of upper Assam dominated by Patkai Range, i.e., Dibrugarh and Tinisukia District. Much of northeastern Hills (Dibrugarh District of upper Assam and southern Assam are part of Patkai range) is dominated by Patkai range but Karbi Hills remain isolated from this range and hence some species of Patkai and eastern Himalaya are likely to be absent here. Hence, the study was important from bio-geographic point of view.

This study will help to elucidate the importance of lowland forest in northeastern India from a biodiversity prospective. Species such as *Salanoemia fuscicornis*, which has only been reported from Cachar of Assam

in northeastern India, was sighted in PF showing the importance of the area. Other than (Cachar, Panbari) Assam of northeastern India, the species is known to occur from southern Myanmar, Malaya, Siam, Pulo Laut. *Salanoemia fuscicornis* was recorded from low altitude of PF, around 90m of sea level. The record of such species from the area shows the importance of conserving the low altitude forest of upper Assam and southern Assam Hills. PF is well protected under KNP while neighbouring forests like Dollamora, which are as significant as Panbari, are facing serious problems of logging and deforestation. Fuel wood extraction is going on regularly and should be stopped. Many stone quarries are also in the making in Dollamora and other accessible areas of KA. An effort should be made to save the last remaining forests in this area. Conservation priority of the woodlands and hills in this area is lacking, with efforts being concentrated on saving the floodplains of Kaziranga National Park.

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