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Notes on some interesting butterflies (Lepidoptera) from Nambor-Doigrung wildlife Sanctuary, North East India

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Abstract

A survey was carried out to find out the butterfly fauna present in Nambor-Doigrung Wildlife Sanctuary, Assam. A total of 224 species of butterflies distributed in 5 families have been collected and identified. The paper throws light on the description of some interesting butterflies (Lepidoptera) and their status as per Evans (1932) from the study area. The study revealed, 224 butterfly species belonging to 137 genera representing 5 families from Nambor-Doigrung Wildlife Sanctuary, 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 during study time such as *Lasippa viraja viraja*, *Lamproptera curius curius*, *Capila zennara*, *Cupitha purreea* and *Bibasis sena sena*; all are included in Schedule I of the Indian Wildlife (Protection) Act (IWPA), 1972.

Keywords: Survey, Butterfly fauna, Species, Status.

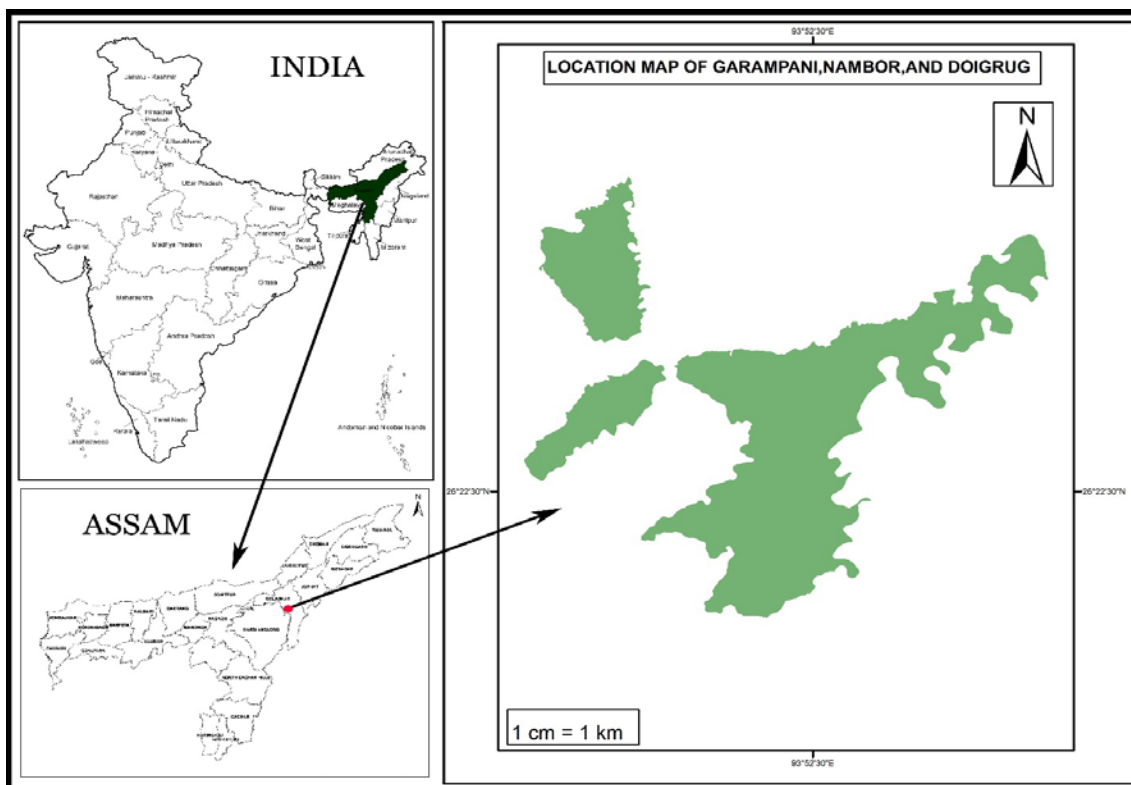
1. Introduction

North-East India is the one of the mega bio-diversity hotspots of the world, which comprises of seven states and Sikkim. It can be differentiated into the Eastern Himalaya, the North-east Hills, and the Brahmaputra Valley. The biogeography of NE India is comparatively complex due to the unique tectonic and climatic condition, is located in the Indo-Malayan zoographic region, hence species that have affinities with Southeast Asian fauna and Indian fauna like other taxa, is very high. Also it is known as Biodiversity Hot Spot for Butterfly fauna^[3]. About 962 species of butterfly belonging to five families described from Assam region alone, of which 69 species of Papilionidae, 57 Pieridae, 269 Lycaenidae, 356 Nymphalidae and 211 species belonging to family Hesperidae^[3]. Evans had done major taxonomic and natural history work on butterflies in Assam, Manipur, Naga Hills, Sikkim and Burma also. Wood-Mason, J. & L. de Niceville (1887) prepared a list of butterflies found in Cachar. In the year 1915, Tytler had also done work on butterflies in Manipur and Naga Hills. Work was done on butterflies in Khasi and Jaintia Hills by Parsons & Cantlie (1948)^[12]; Cantlie (1952, 1956)^[1, 2] had also done works on Hesperidae Butterflies in Khasi and Jaintia Hills. After that European lepidopterists the species discovery, study and information on butterflies of this region has been slowed down, a few notable works on butterflies of this North east regions such as Radhakrishnan (1989), Arun P. Singh (2002), Larsen (2004), Kunte (2005), and Monsoon J. Gogoi (2012). Nevertheless, maximum areas have remained practically unexplored.

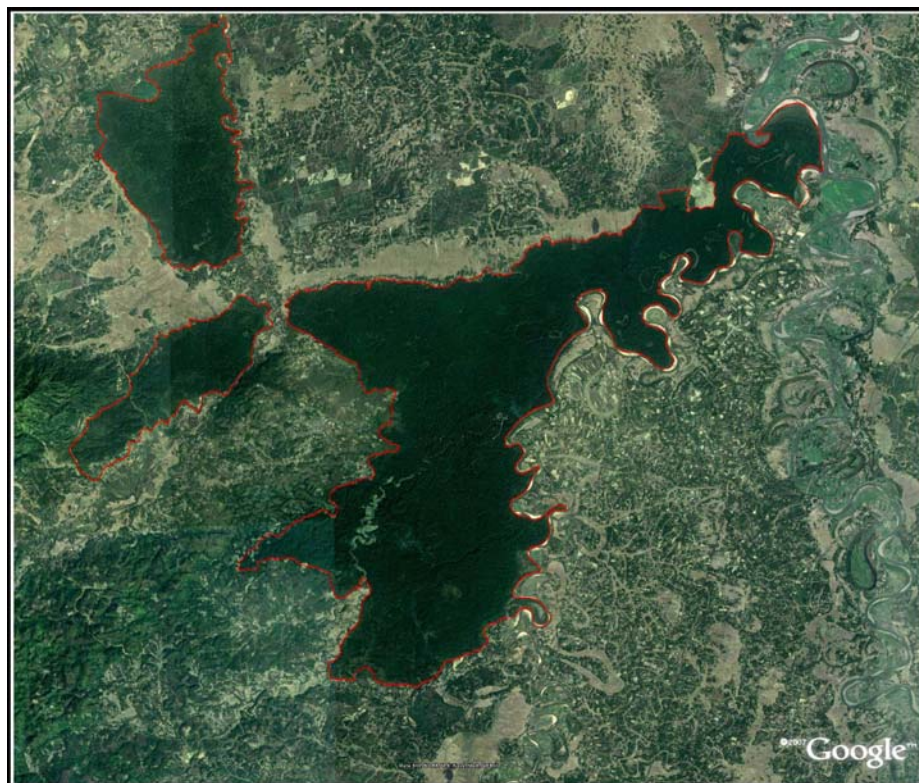
2. Methodology

The Nambor-Doigrung Wildlife Sanctuary (26°25'N, 93°43'E) (NDWS) extending upto a foothill area of Karbi Anglong district is actually located in Golaghat district of Upper Assam which covers an area of 97.15 sq km and has been brought into public recognition with effect from the year 2003. It lies in the foothills of Karbi Anglong and altitude varies from 100m to 200m. The mean annual temperature varies from 6°C to 36°C and rainfall from 2000mm to 2300mm. The plains are the floodplains of the Dhansiri River. The forest type is Tropical Semi-evergreen rainforest with of evergreen and marsh forest. The forest is largely intact with a closed canopy. The middle storey is dense and the undergrowth includes bamboo, reed like shrubs. Some deciduous tree species such as *Tetrameles nudiflora* can be seen throughout the range.

2.1. Study Area



Map 1: Map showing the study area of Nambor-Doigrung-Garampani Wildlife Sanctuary.



Map 2: Google map showing the location study area of Nambor-Doigrung-Garampani Wildlife Sanctuary.

3. Material and Methods

The survey was conducted on sunny days in different seasons; June (2010), August (2011), December (2011), March-April (2012), May-June (2012), August (2012), October (2012),

December (2012), May (2013), August (2013), October - December (2013), May- June (2014). Visual search and photography were conducted on different forest trails and hill streams regularly between 09.00–14.00 hr Butterfly species

were identified directly in the field visually with the help of field guides followed by photography, in difficult cases, rarely by capture. The identification of Butterflies was done by using the identification keys of Moore (1890-1905), Swinhoe (1905-1913), Evans (1932)^[3], Talbot (1939, 1947)^[18, 19], and photographic guides of Kehimkar (2008)^[5] and Haribal (1992)^[4].

4. Results and Discussion

The field study revealed, 224 butterfly species belonging to 137 genera representing 55 families from NDWS (Table 1). Out of 224 species; Nymphalidae showed the maximum species richness, comprising of 38% with 84 species, followed by Lycaenidae (62 species, 28%), Hesperidae (40 species, 18%), Pieridae (19 species, 8%), Papilionidae (19 species, 8%) were recorded during study period. However, Evans previously recorded Papilionidae was dominating family with 69 species (77%) from this region, out of 92 species from all over India. Although North-East India globally represents Swallowtail-rich zones^[3]. Papilionidae as well as Pieridae collection from the present study area were comparatively very low (19 species recorded). Recently Bawri and Basumatary had described 123 species from the Nambor and Garampani Wildlife Sanctuary in 2014. Nevertheless, maximum species have remained practically unexplored from this region and more taxonomical study required. There were some very important species encountered during study time such as *Lasippa viraja viraja*, *Lamproptera curius curius*, *Capila zennara*, *Cupitha purreea* and *Bibasis sena sena*; which is also included on Schedule I of the Indian Wildlife (Protection) Act (IWPA), 1972 respectively. Apart from butterflies, other threatened wildlife recorded from the study area during the survey period was, Asiatic Elephant, Indian Giant Squirrel, Hoolock gibbon, Deer, and Birds such as Hornbill. The availability of all these specimens shows that the forests are rich in flora and unique habitats that hold the diversified animal diversity. The 39th National Highway passes through the NDWS, create major disturbance to both animals and butterflies of the sanctuary. Especially the male butterflies belonging to the Papilionidae, Nymphalidae, Lycaenidae families doing mud puddling were often found lying dead nearby the roadside as they were crushed over by the heavy loaded vehicles. Other activities like firewood collection, clearing of forest edges for tea plantations, etc. would cause disturbance in these habitats. An effort should be made to save the last remaining forests in this area and creating awareness among the common people to these amazing butterflies.

5. Notes on Selected Species

Orange Tail Awl, *Bibasis sena sena* (Image 1): Two individual species were encountered at afternoon hours in October 2013 and June 2014. The species was first described in 1956 from Khasi Hills by Cantlie. The species has also been photographed and sighted recently from Mishimi Hills & Garo Hills. The species is treated as rare in Evans 1932^[3] and legally protected under Schedule II of the Wildlife (Protection) Act (Anonymous 1997). This species is distributed from SW India, NE India and Burma.

Pale Striped Dawnfly, *Capila zennara* (Image 2): Two individual male species were photographed, one in June 2012 and another one June 2014. This species had previously been reported from Nichuguard, Naga Hills and Sebong, Naga Hills (Tytler 1915)^[21]. In recent times, it has only been sighted from Jeypore- Dihing Reserve Forest (Monsoon Jyoti Gogoi, 2010),

Buxa Tiger Reserve Forest (Vivek Sarkar, 2010). This species is very rare as per Evans (1932)^[3]. Ranges of this species are Sikkim and NE India.

Striped Dawnfly, *Capila jayadeva* (Image 3): One individual was encountered in May 2013. It had been recently reported from Arunachal, Assam, Darjeeling and Sikkim also. The distribution ranges are Nepal, NE India. This species is treated as rare (Evans 1932)^[3].

White Banded Flat, *Celaenorrhinus asmara consertus* (Image 4): Our single record was in June 2012. This species is distributed from NE India, Bangladesh and Burma. It has previously been reported from the Khasi Hills by Cantlie 1956^[2] and is uncommon species for northeast India. As per Evans 1932^[3] it is not rare.

Water Snow Flat, *Tagiades litigiosa litigiosa* (Image 5): A few time recorded this species during the survey period. It is not rare as per Evans 1932^[3], but is common in Khasi Hill as per Cantlie 1956^[2]. It is ranges from S India, Sikkim, NE India, Nepal and Burma.

Spotted Snow Flat, *Tagiades menaka menaka* (Image 6): We had a single record of this species during survey period. It is common as per Evans 1932^[3]. It is ranges from S India, Sikkim, NE India, Nepal and Burma.

Dusky Yellow-Breasted Flat, *Gerosis phisara phisara* (Image 7): Only two individual recorded in October, 2013, which is seen down side of leaves. It is found from Sikkim to Arunachal, NE India, and Burma and it is treated as not rare by Evans, 1932^[3].

Woollett's Bob, *Scobura woolletti woolletti* (Image 8): One individual female species was photographed, June 2014. Previously only one female had been reported from Manipur Hills (Evans 1949). T. Norman had collected two males and two females from Sivsagar in Assam Valley. In recent times, it had only been sighted from Gibbon Wildlife Sanctuary (Hemant Ogale and Abhijit Narvekar, Mar 2013). This species is very rare as per Evans (1932)^[3]. Ranges of this species from NE India to Borneo.

Narrow Banded Velvet Bob, *Koruthaialos rubecula* (?) (Image 9): One time had been seen at NDWS in December, 2011. It is ranges from C Nepal, NE India and Bangladesh. And it is common as per Evans, 1932^[3].

Wax Dart, *Cupitha purreea* (Image 10): Our records were based on only two individuals, one each in May 2013 and October 2013. It is not common in Nambor and it is not rare in NE India but rare in SW India (Evans, 1932)^[3]. And the distribution of this species is SW India, NE India, Andaman, Nepal and Burma.

Tiger Hopper, *Ochus subvittatus subradiatus* (Image 11): One individual was encountered in August 2011. The race is distributed from NE India to Kumaon to Dawnas. It is not rare (Evans 1932)^[3].

Paintbrush Swift, *Baoris farri farri* (Image 12): We recorded this species many times. This species ranges from SW India, Sikkim, West Bangle, NE India, Andaman and Burma. It is not rare (Evans 1932)^[3] and protected under Schedule IV of the

Wildlife (Protection) Act.

White Dragontail, *Lamproptera curius curius* (Image 15): Two times found this species at NRF (August 2013 and October 2013). It is quite uncommon Species. It was recently found at Arunachal (Namdapha NP, 2007 and Pakke Reserve, 2009). It is ranging from NE India, Ne Bangladesh and Burma. It is not rare, Evans 1932 ^[3].

Five Bar Swordtail, *Graphium antiphates pompilius* (Image 16): It was sighted in two times during the study period (December 2011 and June 2013). It is common in NE India, but rare in SW India. It is distributed from SW India, Nepal, Ne India, and Burma.

Spangle, *Papilio protenor euprotenor* (Image 17): Few times had been seen at NRF during survey, whose males are seen mud-puddling with other *Papilios* along forest streams. It is distributed from Kashmir to NE India, Nepal and Burma. It is not rare as per Evans 1932 ^[3].

Common Raven, *Papilio castor castor* (Image 18): It is common species, found many times. The distribution ranges from Nepal, Sikkim, and NE India to Burma. The species is reportedly not rare in NE India (Evans, 1932) ^[3].

Common Batwing, *Atrophaneura varuna astorion* (Image 19): A few times were sighted at Nambor during the field study. It is distributed from Garhwal to NE India, NE Bangladesh, and Burma to Tavoy. It is not rare as per Evans, 1932 ^[3].

Common Birdwing, *Troides Helena Cerberus* (Image 20): This species was sighted four times during field study. These are usually seen flying in the upper canopy along forest streams and edges. As per Evans 1932 ^[3] this species is not rare. The distribution of this species is C Nepal, NE India, Bangladesh, and Burma.

One Spot Grass Yellow, *Eurema andersonii jordani* (Image 21): Only one species had seen during study period, October 2013. The species is treated as not rare as per Evans. The distribution of this species is all over India, Bangladesh, Bhutan and Burma.

Tree Yellow, *Gandaca harina assamica* (Image 22): The species was encountered a few times at NRF. It is uncommon at NRF, but is not rare as per Evans 1932 ^[3]. The distribution is from Orissa, C Nepal to NE India, NE Bangladesh, and N Burma.

Red Spot Sawtooth, *Prioneris philonome clemathe* (Image 23): The species was seen once at NRF in July 2012. This species is ranges from NE India to Burma. This species, Evans treated as rare.

Yellow Orangetip, *Ixias pyrene familiaris* (Image 24): This was common especially in open forests and found several times at field study. This species is ranges from India, Sri Lanka, Nepal, Bangladesh and Burma also. The species is reported common at NE India (Evans 1932) ^[3].

Lesser Gull, *Cepora nadina nadina* (Image 25): This was Uncommon in Nambor. Two times were seen during the study period. The distribution is Sri Lanka, SW India, Andaman, C

Nepal, NE India, Bangladesh, and Burma. It is not rare in NE India, Evans 1932 ^[3].

Yellow-Disc Tailless Oakblue, *Arhopala perimuta perimuta* (Image 26): Two times were sighted at study area in June 2012. The distribution of this species ranges are Nepal, NE India, and Burma. It was recently many times found in Sikkim and Assam and Mizoram also. This species, Evans treated as not rare, but it is rare in NE India.

Indian Oakblue, *Arhopala atrax* (Image 27): Only once encountered at NDWS in August, 2013. This species is quite uncommon at NDWS. It is common as per Evans, 1932 ^[3]. It is distributed in NE India only and Burma also.

Sylhet Oakblue, *Arhopala silhetensis silhetensis* (Image 28): Three times were encountered at NRF during the study time. It is distributed from Sikkim to NE India, NE Bangladesh and Burma. It is recently found in Sikkim, Assam, Manipur and Naga Hills also. This species is treated as Rare by Evans, 1932. The species is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Peacock Oakblue, *Arhopala horsfieldi eurysthenes* (Image 29): Only one individual was sighted during survey period, June 2014. This species distributed from C Nepal to Arunachal, NE India, NE and SE Bangladesh, and Burma to Ataran. As per Evans it is a rare species.

Tamil Oakblue, *Arhopala bazaloides bazaloides* (Image 30): This species was found several times in study period, it is not rare in NRF. The distributing range of this species is from SW India to NE India and Burma. It is recently found many times from SW India (Karnataka, Travancore, Mysore, Croog), West Bengal, Assam. The species is treated as rare by Evans, 1932 ^[3]. The species is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Branded Yamfly, *Yasoda tripunctata tripunctata* (Image 31): The species was encountered many times during the study period in NDWS. The species is distributed only in Sikkim to NE India and NE Bangladesh (Sylhet) and Burma. It is uncommon in NDWS, as per Evans 1932 it is a rare species. The species is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Witch, *Araotes lapithis lapithis* (Image 32): Only one time encountered this species during field study in NDWS, October 2013. It was recently found in Panbari Reserve forest, Assam by Monsoon Jyoti Gogoi, 2010 and also in Nameri National Park by Sanjay Sondhi, 2008. It is only found from Sikkim to NE India and also in SE Bangladesh, and Burma. It is also rare as per Evans, 1932 ^[3], and also protected under Schedule II of the Wildlife (Protection) Act, 1972.

Common Onyx, *Horaga onyx onyx* (Image 33): This species is not rare in NE India (Evans 1932) ^[3] and it is also protected under Schedule II of the Wildlife (Protection) Act, 1972. In NDWS it was sighted a few times. The species is distributed from Kangra to NE India, SE Bangladesh, and Burma.

Common Imperial, *Cheritra freja evansi* (Image 34): It is an uncommon species from NDWS. Only one time, it was encountered. It is not rare as per Evans 1932 ^[3] and it ranges from Kumaon to Arunachal, NE India, SE Bangladesh, and

Burma to Tavoy.

Blue Imperial, *Ticherra acte acte* (Image 35): This species was encountered a few times. It is also an uncommon species in NDWS. It is not rare as per Evans, 1932^[3] and it is distributed from Arunachal, NE India, Bangladesh and Burma. Common Tinsel, *Catapaecilma major anais*: Our record was based only on a single timesighted species at NRF in Oct 2013. The sub species *anais* is only found in NE India. This species is rare in South-West India but not rare in North-East India, Evans 1932^[3].

Plane, *Bindahara phocides phocides* (Image 36): Three males and two females were sighted in the month of December, 2011 and October, 2013. It is distributed from Sikkim to NE India, Bangladesh, and Burma. The species is rare in north-eastern India, Evans 1932^[3]. This species is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Double-tufted Royal, *Dacalana penicilligera penicilligera* (Image 37): A single species was encountered in the month of June, 2014. It ranges from Arunachal, NE India, NE Bangladesh, and Burma to Dawnas. As per Evans 1932^[3], it is not rare.

Orchid Tit, *Chliaria othona othona* (Image 38): A Few times we were recorded it from NDWS. As per Evans 1932^[3], it is not rare. This species is protected under Schedule I of the Wildlife (Protection) Act, 1972. It is distributed in SW India, NE India, Bangladesh, Burma and Andaman also.

Indigo Flash, *Rapala varuna orseis* (Image 39): We were recorded one individual record in December 2011. It is not rare in NE India, Evans 1932^[3]. This species is protected under Schedule II of the Wildlife (Protection) Act, 1972. This subspecies is distributed in Nepal and Jharkhand to W Bengal, NE India, NE Bangladesh, and Burma.

Cachar Flash, *Artipe skinneri* (Image 40): Only one individual was recorded during the study time. It was recently found in Karbi Anglong, Assam by Monsoon Jyoti Gogoi, 2010. As per Evans, 1932^[3] it is very rare.

Narrow Spark, *Sinthusa nasaka obscurata* (Image 41): Two species were recorded from Nambor reserved forest during June 2013. The distribution is from Sikkim to Arunachal, NE India and Burma. As per Evans, 1932^[3] it is a rare species.

Dingy Lineblue, *Petrelaea dana* (Image 42): Only one individual was recorded puddling near stream during the survey in June 2011. Evans 1932^[3] reportedly it is not rare. And it distributed in SW India, NE India, Sri Lanka, Bangladesh, Burma and Andaman also.

Transparent Six Lineblue, *Nacaduba kurava euplea* (Image 43): This species was encountered four times at NDWS. The *euplea* species is NE Indian species, found from Kumaon to NE India, NE Bangladesh, and Burma. Andamans, Car and C. Nicobars. It is not rare in NE India, Evans 1932^[3].

Tailless Lineblue, *Prosotas dubiosa indica* (Image 44): This species was not common in NDWS, few times were found during study period. It is common as per Evans 1932^[3]. The distribution is Sri Lanka, S India, W Bengal, Pakistan, Kumaon to NE India, Bangladesh, and Burma, Andamans

also.

Banded Lineblue, *Prosotas aluta coelestis* (Image 45): This species was many times recorded and is common in NDWS. It is distributed from Kumaon to Arunachal, NE India, and Burma, Andamans also. And it is reportedly rare in NE India, Evans 1932^[3]. This species is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Metallic Cerulean, *Jamides alecto alecto* (Image 46): Few times were recorded at Nambor, It is not common in NDWS. It is commonly found in NE India (Evans 1932)^[3]. This species ranges from SW India, W Bengal, NE India, and Burma.

Glistening Cerulean, *Jamides elpis pseudelpis* (Image 47): Only one individual sighted from NDWS. The subspecies is distributed from Sikkim to Assam. It is not rare (Evans 1932)^[3]. It ranges from Sikkim to NE India.

Silver Forget-me-not, *Catochrysops panormus exiguous* (Image 48): Two times we were encountered; a male is encountered in mud puddling. It is not rare, Evans 1932^[3]. The subspecies *exiguus* found in SW India, NE India, C Nepal, Bangladesh, Burma; *andamanicais* found only in Andamans and *lithargyriais* only Sri Lanka also.

Forest Quaker, *Pithecops corvus correctus* (Image 49): Once we were encountered this butterfly in June 2014. The distribution is from Nepal to Arunachal, NE India, SE Bangladesh, and Burma. According to Evans (1932)^[3], it is not rare.

Double Banded Judy, *Abisara bifasciata angulate* (Image 52): Only a single individual was recorded in Nov, 2013. It is found in NE India and Burma to Karens. As per Evans, 1932^[3] it is treated as common.

Tailed Judy, *Abisara neophron neophron* (Image 53 & Image 54): A single individual was recorded in May 2013. It is uncommon at NDWS. This subspecies is only found in NE India and Burma. It is reported as not rare, Evans 1932^[3].

Dark Blue Tiger, *Tirumala septentrionis septentrionis* (Image 55): It was only two times seen in NDWS, it is not common at NRF. As per Evans, 1932^[3] it is common in NE India and this subspecies is distributed in Kangra to NE India, NE Bangladesh, and Burma.

Chocolate Tiger, *Parantica melaneus* (Image 56): This was uncommon for Nambor, only one time it was found. It is distributed from C Nepal to NE India, and Burma to Tavoy. It is common in NE India.

Spotted Blue Crow, *Euploea midamus rogenhoferi* (Image 57): It was only abundantly found at NDWS in month of May & June 2012. It is also an uncommon at NRF, but as per Evans, 1932^[3] it is rare species and is distributed from Nepal-Assam-Karens. This species is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Double Branded Blue Crow, *Euploea sylvester hopei* (Image 58): Only one road kill species was found at NRF. This species found in India, Nepal, Sri Lanka, Bangladesh, Burma, but the subspecies *hopei* is only found in NE India, Nepal and Burma also. It is also an uncommon species in NRF. This species is

treated as not rare, Evans 1932^[3].

Striped Black Crow, *Euploea doubledayi doubledayi* (Image 59): Many times were sighted in the month of May 2012. In this month the crows are abundantly found near the bank of the Nambor River visiting flowers of *Heliotropium indicum* even the dried plant of the species. This species has two subspecies; one *doubledayi* is found in Sikkim, NE India, Bangladesh, and Burma. And another is *evalida*, which is found in Burma from Pegu and Karens. In NE India it is not rare (Evans 1932)^[3].

Purple Bushbrown, *Mycalesis orseis nautilus* (Image 61): This species was found only once in the month of November. It is distributed in NE India (C Assam and Nagaland) and Burma. It is reported as very rare.

Plain Bushbrown, *Mycalesis malsarida* (Image 62): This species was found only once in July 2011 at NDWS during the survey period. It is reported only from Arunachal and NE India. It is a rare species.

Watson's Bushbrown, *Mycalesis adamsonii adamsonii* (Image 63): This species was seen thrice at NDWS during June 2011, 2012 and June 2014. It is found in E Arunachal, NE India (SE Assam, Manipur), and N Burma. As per It is a rare species.

Whitebar Bushbrown, *Mycalesis anaxias aemate* (Image 64): This species was found only once at NDWS in June 2011. Its distribution is from Nepal to Arunachal, NE India, NE Bangladesh and Burma. There is another subspecies *Mycalesis anaxias anaxias* which is found from SW India to S Karnataka. It is not rare, as per Evans, 1932^[3].

Common Faun, *Faunis canens arcesilas* (Image 65): This species was found only once in June 2014. It is found from Sikkim to Arunachal, NE India, and Burma. As per Evans (1932)^[3], it is known as Common.

Black Veined Sergeant, *Athya ranga ranga* (Image 67): Few times had been seen in NDWS. The subspecies *rangais* found in NE India, Nepal, Bangladesh and Burma also and another subspecies *karwara* found in S India. This species is treated as rare in Evans, 1932^[3]. It is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Unbroken Sergeant, *Athya pravara acutipennis* (Image 68): Only one time seen in October, 2013. It is found in Arunachal, NE India and Burma also. This species is treated as rare in Evans, 1932^[3]. It is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Yellow Jack Sailer, *Lasippa viraja viraja* (Image 70): Only two individuals were recorded in August and October 2013. It is only found in SW India, NE India and Andaman. And it is not rare as per Evans, 1932^[3].

Dingiest Sailer, *Neptis harita harita* (Image 71): Two to Three individuals were encountered in May and October, 2012 and October, 2013. It is distributed from Kumaon to NE India, Burma to Shan States. This species is treated as not rare in Evans, 1932^[3].

Green Commodore, *Sumalia daraxa daraxa* (Image 72): It was sighted for two times in June 2012 and 2013. It is uncommon in NDWS. This species is rare in Kumaon and E Nepal but not rare from Sikkim to Arunachal, NE India, NE Bangladesh and Burma to Karens.

Clipper, *Parthenos sylvia gambrisius* (Image 73): It was abundantly found only in the month of August 2011, but after that hardly three to four times it had been seen in NDWS. It is uncommon in NDWS. This species is not rare in NE India but rare in South West India. It is protected under Schedule II of the Wildlife (Protection) Act, 1972. It is distributed in SW India, NE India, Andaman, Sri Lanka, Bangladesh and Burma.

Courtesan, *Euripus nyctelius nyctelius* (Image 74): One species doing mudpuddling was once sighted in the month of June 2013. It is uncommon to NDWS. It is distributed to Garhwal (Mussoorie, old record). Sikkim to Arunachal, NE India, NE Bangladesh, and Burma. As per Evans (1932)^[3], it is not rare.

Great Nawab, *Polyura eudamippus eudamippus* (Image 75): It was only one time seen at NDWS. This species is distributed in Kumaon to NE India to Burma. It was recently found at Similipal Hills by M. Nair in 2011. It is reported as not rare in NE India by Evans, 1932^[3].

Archduke, *Lexias pardalis jadeitina* (Image 77): Two times had been sighted, one male and one female in December, 2011 and one female in August, 2013. It is not rare, Evans 1932^[3] and is distributed from NE India to Burma. It is protected under Schedule II of the Wildlife (Protection) Act, 1972.

Dark Archduke, *Lexias dirtea khasiana* (Image 78): Three times had been sighted, one female in December, 2011 and two female and one male are sighted in October, 2013. This species is not rare, Evans 1932^[3] and protected under Schedule II of the Wildlife (Protection) Act, 1972. This subspecies is distributed only from Sikkim to Assam.

Common Yeoman, *Cirrochroa tyche mithila* (Image 80): It is very common species, which is abundantly found in month August-October during mud puddling. It is locally common at Nambor, also common as per Evans, 1932^[3]. It has two subspecies; one *mithila* is found in E Nepal, NE India, Bangladesh, and Burma and sometimes found in C India. Another is *anjira*, only found in Andaman.

Large Yeoman, *Cirrochroa aoris aoris* (Image 81): This species was abundantly many times found in Nambor. It is common at Nambor. It is only found in NE India, sometimes Nepal also. It is not rare in Evans, 1932^[3].

Orange Oakleaf, *Kallima inachus inachus* (Image 82): Only two times it had been seen. It is also uncommon at Nambor, but not rare in Evans, 1932^[3]. This subspecies is distributed in Bihar to NE India and Burma.

Autumn Leaf, *Doleschallia bisaltide indica* (Image 83 & Image 84): A few times it was recorded from NDWS. Out of six subspecies of *Doleschallia bisaltide*, this species is distributed from C Nepal to Arunachal, NE India, and Burma. It is not common in NDWS, but according to Evans (1932)^[3], it is not rare.

Table 1: Annotated list of butterflies recorded in NDWS, Assam during the study period.

SL No:	Species Name	Common Name
Family: Hesperidae		
1.	<i>Bibasis sena sena</i>	Orange Tail Awl
2.	<i>Hasora chromus chromus</i>	Common Banded Awl
3.	<i>Burara oedipodea belesis</i>	Branded Orange Awlet
4.	<i>Capila zennara</i>	Pale Striped Dawnfly
5.	<i>Capila jayadeva</i>	Striped Dawnfly
6.	<i>Sarangesa dasahara dasahara</i>	Common Small Flat
7.	<i>Pseudocoladenia dan</i>	Fulvous Pied Flat
8.	<i>Celaenorrhinus leucocera</i>	Common Spotted Flat
9.	<i>Celaenorrhinus asmara consertus</i>	White Banded Flat
10.	<i>Tagiades japetus ravi</i>	Common Snow Flat
11.	<i>Tagiades litigiosa litigiosa</i>	Water Snow Flat
12.	<i>Tagiades menaka menaka</i>	Spotted Snow Flat
13.	<i>Tagiades gana athos</i>	Suffused snow flat
14.	<i>Gerosis phisara phisara</i>	Dusky Yellow-Breasted Flat
15.	<i>Odontoptilum angulatum angulatum</i>	Chestnut Angle
16.	<i>Oriens gola pseudolus</i>	Common Dartlet
17.	<i>Oriens goloides</i>	Ceylon Dartlet
18.	<i>Halpe porus</i>	Moore's Ace
19.	<i>Matapa aria</i>	Common Red Eye
20.	<i>Gangara thyrsis thyrsis</i>	Giant Redeye
21.	<i>Telicota bambusae bambusae</i>	Dark Palm Dart
22.	<i>Pothantus spp</i>	Dart spp
23.	<i>Suastus gremius gremius</i>	Palm Indian Bob
24.	<i>Koruthaialos rubecula (?)</i>	Narrow-banded Velvet Bob
25.	<i>Koruthaialos butleri</i>	Dark Velvet Bob
26.	<i>Scobura woolletti woolletti</i>	Woollett's Bob
27.	<i>Psolos fuligo</i>	Coon
28.	<i>Spialia galba</i>	Indian Skipper
29.	<i>Cupitha purreea</i>	Wax Dart
30.	<i>Iambrix salsala salsala</i>	Chestnut Bob
31.	<i>Ancistroides nigrata diocles</i>	Chocolate Demon
32.	<i>Notocrypta paralyos arisana</i>	Common Banded Demon
33.	<i>Udaspes folus</i>	Grass Demon
34.	<i>Ampittia dioscorides dioscorides</i>	Bush Hopper
35.	<i>Ochus subvittatus subradiatus</i>	Tiger Hopper
36.	<i>Aeromachus pygmaeus</i>	Pygmy Scrub Hopper
37.	<i>Parnara guttata</i>	Straight Swift
38.	<i>Pelopidas mathias mathias</i>	Small Branded Swift
39.	<i>Baoris farri farri</i>	Paintbrush Swift
40.	<i>Pseudoborbo bevani</i>	Bevan's Swift
Family: Papilionidae		
41.	<i>Graphium sarpedon sarpedon</i>	Common Bluebottle
42.	<i>Graphium doson axion</i>	Common Jay
43.	<i>Graphium eurypylus acheron</i>	Great Jay
44.	<i>Graphium agamemnon agamemnon</i>	Tailed Jay
45.	<i>Graphium antiphates pompilius</i>	Five Bar Swordtail
46.	<i>Lamproptera curius curius</i>	White Dragontail
47.	<i>Chilasa clytia clytia</i>	Common Mime
48.	<i>Papilio polytes</i>	Common Mormon
49.	<i>Papilio memnon agenor</i>	Great Mormon
50.	<i>Papilio helenus helenus</i>	Red Helen
51.	<i>Papilio nephelus chaon</i>	Yellow Helen
52.	<i>Papilio protenor euprotenor</i>	Spangle
53.	<i>Papilio demoleus demoleus</i>	Lime Butterfly
54.	<i>Papilio polyctor</i>	Common Peacock
55.	<i>Papilio paris paris</i>	Paris Peacock
56.	<i>Papilio castor castor</i>	Common Raven
57.	<i>Atrophaneura varuna astorion</i>	Common Batwing

58.	<i>Atrophaneura aristolochiae aristolochiae</i>	Common Rose
59.	<i>Troides helena cerberus</i>	Common Birdwing
Family: Pieridae		
60.	<i>Eurema hecabe hecabe</i>	Common Grass Yellow
61.	<i>Eurema blanda silhetana</i>	Three Spot Grass Yellow
62.	<i>Eurema brigitta rubella</i>	Small Grass Yellow
63.	<i>Eurema andersonii jordani</i>	One Spot Grass Yellow
64.	<i>Gandaca harina assamica</i>	Tree Yellow
65.	<i>Catopsilia pomona</i>	Common Emigrant
66.	<i>Catopsilia pyranthe pyranthe</i>	Mottled Emigrant
67.	<i>Ixias pyrene familiaris</i>	Yellow Orangetip
68.	<i>Hebomoia glaucippe</i>	Great Orangetip
69.	<i>Appias olferna</i>	Striped Albatross
70.	<i>Appias lycinda</i>	Chocolate Albatross
71.	<i>Pieris canidia</i>	Indian Cabbage White
72.	<i>Pieris brassicae</i>	Large Cabbage White
73.	<i>Cepora nadina nadina</i>	Lesser Gull
74.	<i>Appias indra indra</i>	Plain Puffin
75.	<i>Prioneris philonome clemante</i>	Redspot Sawtooth
76.	<i>Delias descombesi</i>	Red Spot Zezebel
77.	<i>Delias pasithoe</i>	Red Base Zezebel
78.	<i>Leptosia nina nina</i>	Psyche
Family: Lycaenidae		
79.	<i>Arhopala centaurus</i>	Centaur Oakblue
80.	<i>Arhopala perimuta perimuta</i>	Yellow-Disc Tailless Oakblue
81.	<i>Arhopala bazaloides bazaloides</i>	Tamil Oakblue
82.	<i>Arhopala silhetensis silhetensis</i>	Sylhet Oakblue
83.	<i>Arhopala atrax</i>	Indian Oakblue
84.	<i>Arhopala horsfieldi eurysthenes</i>	Peacock Oakblue
85.	<i>Surendra quercetorum quercetorum</i>	Common Acacia Blue
86.	<i>Loxura atymnus continentalis</i>	Yamfly
87.	<i>Yasoda tripunctata tripunctata</i>	Branded Yamfly
88.	<i>Araotes lapithis lapithis</i>	Witch
89.	<i>Horaga onyx onyx</i>	Common Onyx
90.	<i>Cheritra freja evansi</i>	Common Imperial
91.	<i>Ticherra acte acte</i>	Blue Imperial
92.	<i>Hypolycaena erylus himavatus</i>	Common Tit
93.	<i>Zeltus amasa</i>	Fluffy Tit
94.	<i>Catapaecilma major anais</i>	Common Tinsel
95.	<i>Dacalana penicilligera penicilligera</i>	Double-tufted Royal
96.	<i>Bindahara phocides phocides</i>	Plane
97.	<i>Chliaria othona othona</i>	Orchid Tit
98.	<i>Deudorix epijarbas amatius</i>	Cornelian
99.	<i>Rapala pheretima petosiris</i>	Copper Flash
100.	<i>Rapala iarbus iarbus</i>	Indian Red Flash
101.	<i>Rapala varuna orseis</i>	Indigo Flash
102.	<i>Artipe eryx</i>	Green Flash
103.	<i>Artipe skinneri</i>	Cachar Flash
104.	<i>Sinthusa nasaka</i>	Narrow Spark
105.	<i>Heliophorus epicles indicus</i>	Purple Sapphire
106.	<i>Anthene emolus emolus</i>	Common Ciliate Blue
107.	<i>Anthene lycanina lycambes</i>	Pointed Ciliate Blue
108.	<i>Caleta elna noliteia</i>	Elbowed Pierrot
109.	<i>Castalius rosimon rosimon</i>	Common Pierrot
110.	<i>Tarucus ananda</i>	Dark Pierrot
111.	<i>Petrelaea dana</i>	Dingy Lineblue
112.	<i>Nacaduba kurava euplea</i>	Transparent six Lineblue
113.	<i>Prosotas dubiosa indica</i>	Tailless Lineblue
114.	<i>Prosotas nora</i>	Common Lineblue
115.	<i>Prosotas aluta coelestis</i>	Banded Lineblue
116.	<i>Jamides celeno aelianus</i>	Common Cerulean
117.	<i>Jamides bochus bochus</i>	Dark Cerulean
118.	<i>Jamides alecto alecto</i>	Metallic Cerulean
119.	<i>Jamides elpis pseudelpis</i>	Glistening Cerulean

120.	<i>Catochrysops strabo strabo</i>	Forget-me-not	184.	<i>Athyma selenophora</i>	Staff Sergeant
121.	<i>Catochrysops panormus exiguus</i>	Silver Forget-me-not	185.	<i>Neptis hylas</i>	Common Sailer
122.	<i>Lampides boeticus</i>	Pea Blue	186.	<i>Neptis nata</i>	Sullied Sailer
123.	<i>Leptotes plinius</i>	Zebra Blue	187.	<i>Neptis clinia susruta</i>	Clear Sailer
124.	<i>Zizeeria karsandar</i>	Dark Grass Blue	188.	<i>Neptis harita harita</i>	Dingiest Sailer
125.	<i>Pseudozizeeria maha</i>	Pale Grass Blue	189.	<i>Lasippa viraja viraja</i>	Yellow Jack Sailer
126.	<i>Zizina otis</i>	Lesser Grass Blue	190.	<i>Phaedyma columella ophiana</i>	Short-banded Sailer
127.	<i>Neopithecops zalmora zalmora</i>	Quaker	191.	<i>Pantoporia hordonia hordonia</i>	Common Lascar
128.	<i>Pithecops corvus correctus</i>	Forest Quaker	192.	<i>Sumalia daraxa daraxa</i>	Green Commodore
129.	<i>Spalgis epeus epeus</i>	Ape fly	193.	<i>Vagrans egista</i>	Vagrant
130.	<i>Megisba malaya sikkima</i>	Malayan	194.	<i>Kaniska canace</i>	Blue Admiral
131.	<i>Acytoplepis pupa</i>	Common Hedge Blue	195.	<i>Phalanta phalantha</i>	Common Leopard
132.	<i>Charana mandarina mandarina</i>	Mandarian Blue	196.	<i>Pseudergolis wedah</i>	Tabby
133.	<i>Euchrysops cnejus cnejus</i>	Gram Blue	197.	<i>Chersonesia risa risa</i>	Common Maplet
134.	<i>Chilades lajus</i>	Lime Blue	198.	<i>Cyrestis thyodamas</i>	Common Map
135.	<i>Curetis thetis</i>	Indian Sunbeam	199.	<i>Moduza procris</i>	Commander
136.	<i>Curetis bulis bulis</i>	Bright Sunbeam	200.	<i>Vindula erota</i>	Cruiser
137.	<i>Abisara neophron neophron</i>	Tailed Judy	201.	<i>Parthenos sylvia gambrisius</i>	Clipper
138.	<i>Abisara bifasciata angulata</i>	Double Banded Judy	202.	<i>Lebadea martha martha</i>	Knight
139.	<i>Abisara echerius paionea</i>	Plum Judy	203.	<i>Euthalia aconthea garuda</i>	Common Baron
140.	<i>Zemerus flegyas</i>	Punchinello	204.	<i>Euthalia monina kesava</i>	Powdered Baron
Family: Nymphalidae			205.	<i>Euthalia phemius phemius</i>	White-edged Blue Baron
141.	<i>Tirumala limniace</i>	Blue Tiger	206.	<i>Tanaecia julii appiades</i>	Common Earl
142.	<i>Tirumala septentrionis septentrionis</i>	Dark Blue Tiger	207.	<i>Euripus nyctelius nyctelius</i>	Courtesan
143.	<i>Danaus chrysippus chrysippus</i>	Plain Tiger	208.	<i>Tanaecia lepidea lepidea</i>	Grey Count
144.	<i>Danaus genutia genutia</i>	Striped Tiger	209.	<i>Lexias pardalis jadeitina</i>	Archduke
145.	<i>Parantica melaneus</i>	Chocolate Tiger	210.	<i>Lexias dirtea khasiana</i>	Dark Archduke
146.	<i>Parantica aglea melanooides</i>	Glassy Tiger	211.	<i>Ariadne merione</i>	Common Castor
147.	<i>Euploea sylvester hopei</i>	Double Branded Blue Crow	212.	<i>Ariadne ariadne pallidior</i>	Angled Castor
148.	<i>Euploea midamus rogenhoferi</i>	Spotted Blue Crow	213.	<i>Symbrenthia lilaea khasiana</i>	Common Jester
149.	<i>Euploea mulciber mulciber</i>	Striped Blue Crow	214.	<i>Junonia atlites atlites</i>	Grey Pansy
150.	<i>Euploea doubledayi doubledayi</i>	Striped Black Crow	215.	<i>Junonia iphita iphita</i>	Chocolate Pansy
151.	<i>Euploea radamanthus radamanthus</i>	Magpie Crow	216.	<i>Junonia lemonias lemonias</i>	Lemon Pansy
152.	<i>Euploea core core</i>	Common Indian Crow	217.	<i>Junonia hierta hierta</i>	Yellow Pansy
153.	<i>Polyura eudamippus eudamippus</i>	Great Nawab	218.	<i>Junonia orithya ocyale</i>	Blue Pansy
154.	<i>Polyura athamas athamas</i>	Common Nawab	219.	<i>Junonia almana almana</i>	Peacock Pansy
155.	<i>Charaxes marmax</i>	Yellow Rajah	220.	<i>Cirrochroa aoris aoris</i>	Large Yeoman
156.	<i>Charaxes bernardus</i>	Tawny Rajah	221.	<i>Cirrochroa tyche mithila</i>	Common Yeoman
157.	<i>Charaxes solon solon</i>	Black Rajah	222.	<i>Hypolimnas bolina jacintha</i>	Great Eggfly
158.	<i>Discophora sondaica indica</i>	Common Duffer	223.	<i>Kallima inachus inachus</i>	Orange Oakleaf
159.	<i>Melanitis leda leda</i>	Common Evening Brown	224.	<i>Doleschallia bisaltide indica</i>	Autumn Leaf
160.	<i>Melanitis phedima</i>	Dark Evening Brown			
161.	<i>Mycalesis perseus</i>	Common Bushbrown			
162.	<i>Mycalesis anaxias aemate</i>	White Bar Bushbrown			
163.	<i>Mycalesis mineus</i>	Dark Brand Bushbrown			
164.	<i>Mycalesis visala</i>	Long Brand Bushbrown			
165.	<i>Mycalesis malsarida</i>	Plain Bushbrown			
166.	<i>Mycalesis adamsonii adamsonii</i>	Watson's Bushbrown			
167.	<i>Mycalesis orseis nautilus</i>	Purple Bushbrown			
168.	<i>Orsotriaena medus medus</i>	Nigger			
169.	<i>Faunis canens arcesilas</i>	Common Faun			
170.	<i>Lethe europa niladana</i>	Bamboo Treebrown			
171.	<i>Lethe mekara zuchara</i>	Common Red Forester			
172.	<i>Elymnias hypermnestra undularis</i>	Common Palmfly			
173.	<i>Elymnias nesaea</i>	Tiger Palmfly			
174.	<i>Ypthima asterope mahratta</i>	Common Threering			
175.	<i>Ypthima huebneri huebneri</i>	Common Fourring			
176.	<i>Ypthima baldus baldus</i>	Common Fivering			
177.	<i>Cethosia cyane</i>	Leopard Lacewing			
178.	<i>Cethosia biblis tisamena</i>	Red Lacewing			
179.	<i>Acraea violae</i>	Tawny Coster			
180.	<i>Athyma perius perius</i>	Common Sergeant			
181.	<i>Athyma ranga ranga</i>	Black Vein Sergeant			
182.	<i>Athyma pravara acutipennis</i>	Unbroken Sergeant			
183.	<i>Athyma nefte</i>	Colour Sergeant			

Family: Hespeiidae



Image 1: *B. sena sena*



Image 2: *C. zennara*



Image 3: *C. jayadeva*



Image 4: *C. asmara consertus*



Image 5: *T. litigiosa litigiosa*



Image 6: *T. menaka menaka*



Image 7: *G. phisara phisara*



Image 8: *S. woolletti woolletti*



Image 9: *K. rubecula* (?)



Image 10: *C. purreea*



Image 11: *O.s. subradiatus*



Image 12: *B. farri farri*



Image 13: *A. pygmaeus*



Image 14: *Pothantus* spp

Family: Papilionidae



Image 15: *L. curius curius*



Image 16: *G. antiphates pompilius*



Image 17: *P. protenor euprotenor*



Image 18: *P. castor castor*



Image 19: *A. varuna astorion*



Image 20: *T. helena Cerberus*

Family: Pieridae



Image 21: *E. a. jordani*



Image 22: *G. harina assamica*



Image 23: *P.p. clemathe*



Image 24: *I. pyrene familiaris*



Image 25: *C. nadina nadina*

Family: Lycaenidae



Image 26: *A. p. perimuta*



Image 27: *A. atrax*



Image 28: *A. s. silhetensis*



Image 29: *A.h. eurysthenes*



Image 30: *A. b. bazaloides*



Image 31: *Y. t. tripunctata*



Image 32: *A. lapithis lapithis*



Image 33: *H. onyx onyx*



Image 34: *C. freja evansi*



Image 35: *T. acte acte*



Image 36: *B. p. phocides*



Image 37: *D. p. penicilligera*



Image 38: *C. othona othona*



Image 39: *R. varuna orseis*



Image 40: *A. skinneri*



Image 41: *S. n. obscurata*



Image 42: *P. dana*



Image 43: *N. kurava euplea*



Image 44: *P. dubiosa indica*



Image 45: *P. aluta coelestis*



Image 46: *J. alecto alecto*



Image 47: *J. e. pseudelpis*



Image 48: *C. p. exiguous*

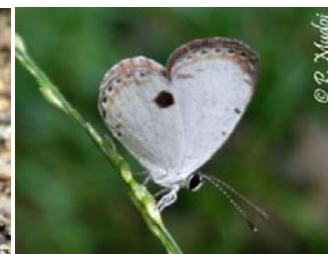


Image 49: *P. c. correctus*

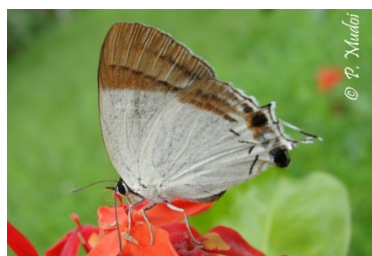


Image 50: *C. m. mandarina*



Image 51: *T. ananda*



Image 52: *A. b. angulate*



Image 53: *A. n. neophron* (UN)



Image 54: *A. n. neophron* (UP)

Family: Nymphalidae



Image 55: *T. s. septentrionis*



Image 56: *P. melaneus*



Image 57: *E. m. rogenhoferi*



Image 58: *E. sylvester hopei*



Image 59: *E. d. doubledayi*



Image 60: *L. m. zuchara*



Image 61: *M. orseis nautilus*



Image 62: *M. malsarida*



Image 63: *M. a. adamsonii*



Image 64: *M. anaxias aemate*



Image 65: *F. c. arcesilas*



Image 66: *C. solon solon*

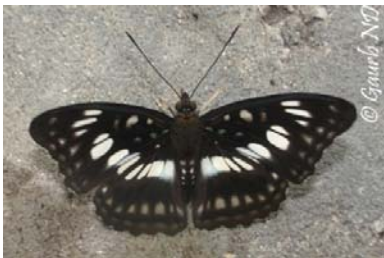


Image 67: *A. ranga ranga*

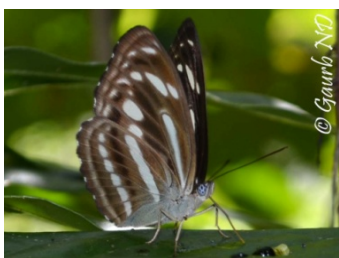


Image 68: *A. p. acutipennis*



Image 69: *A. selenophora*



Image 70: *L. viraja viraja*

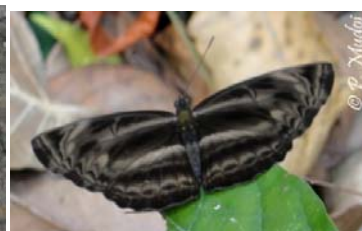


Image 71: *N. harita harita*



Image 72: *S. daraxa daraxa*



Image 73: *P. s. gambrius*



Image 74: *E. n. nyctelius*



Image 75: *P. e. eudamippus*

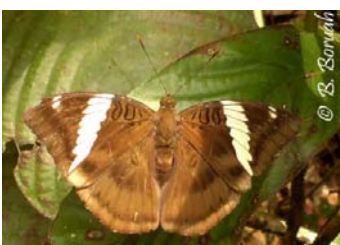


Image 76: *E. p. phemius*

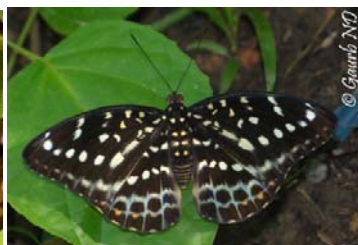


Image 77: *L. p. jadeitina*



Image 78: *L. dirtea khasiana*



Image 79: *C. risa risa*



Image 80: *C. tyche mithila*



Image 81: *C. aoris aoris*



Image 82: *K. i. inachus*



Image 83: *D. b. indica* (UN)



Image 84: *D. b. indica* (UP)

6. Acknowledgments

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