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Validation and documentation of some rare butterflies [Insecta: Lepidoptera] in the Nilgiris, Southern Western Ghats, Tamil Nadu, India

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Abstract

The study involved validation and to document some rare butterflies in the Nilgiris District. Inventories of 14 species belonging to three families were recorded during this study. The maximum number of butterfly species was sampled during the monsoons. Lycaenidae was the most dominant family with 7 species followed by Nymphalidae with 5 species and Hesperidae with 2 species. The present study consists of recording distribution of rare butterflies in Nilgiris District, which may provide basic data for study of Lepidoptera biodiversity of this region. The detailed distribution, locality, forest type and photographs are provided for accurate identification.

Keywords: Rhoplacera, rare, species, distribution, Nilgiris

1. Introduction

Butterflies are one of the large taxonomically grouped insects (Lepidoptera: Rhoplacera) in the world [1, 2]. The 18th century about 19,238 species of butterflies have been documented worldwide [3]. The most studied of butterflies have been documented since 19th century in Southern India [4, 5]. About 300 species have been documented in the Nilgiris by [6]. Butterflies are good indicators of the health of forest ecosystem [7-9] and a critical group in ecology and conservation [10, 11]. Some of these species are very rare and endemic to the Western Ghats [6, 12, -15]. Some are also legally protected in India under the Indian Wildlife Protection Act, 1972. Of these reported species, some are of the rarest genus and have not been seen in the recent past (mentioned below). Information on these species has not been reported in the Nilgiris in recent literature for over three decades. Therefore 426 larval host plants were recorded for Western Ghats butterflies [16]. The loss of Habitat, changes in climatic conditions, distribution pattern and diversity in larval host plants could have resulted in varied changes in occurrence of butterflies which would in turn result in varied conservation measures.

2. Objective: To validate the distribution of some rare butterfly species in the Nilgiris since Larsen T.B. 1987.

3. Materials and Methods

The study was carried out in the Nilgiris District, Tamil Nadu, from 2013 to June 2017 in different forest areas and riparian belt. Nilgiris is situated in the Western Ghats of India, at an elevation of 350 to 2657 meters MSL, with 11°10' and 11°43' N and 76°14' and 77°00' E (Fig.2). The butterflies were observed and recorded directly in the field followed by Pollard walk method [17, 18] from 0700 hours to 1700 hours, with the standard identification keys [13, 15, 19- 22].



Fig 1: Map showing the study area of Nilgiris District, Tamil Nadu, India

Some specimens were collected by sweep nets ^[23] to identify the particular key characteristics for species confirmation by taking photographs and were released in the same habitat. The larval host plants and early stages of some of the species were also noted ^[16, 23, 25]. Due to Biodiversity act, the collection and preservation of butterfly specimen are highly restricted and hence only photographs were taken by using DSLR (Nikon, 70-300mm and Tamron macro 90 mm; 100 mm; Canon, 55-250 mm and macro 100 mm).

4. Results and Discussion

A total of fourteen rare butterfly species from three families were recorded in the Nilgiris District, Tamil Nadu. These species have earlier been reported by Hampson in 1888, Wynter-Blyth in 1943 and then by Larsen B. Torban in 1987. A comparative analysis of the rare species has been carried out from 2013 keeping Larsen B. Torban's accounts as the pivot. Among these three families, Lycaenidae consist of 7 species and Nymphalidae with 5 species and Hesperidae with 2 species. In the present study, the Lycaenids were mostly found in bright sunlight in evergreen forest with riparian tracks. In Nymphalids, the genus *Ypthima* were adapted to moist grasses with rock slopes.

Family: Hesperidae

***Gerosis bhagava* Moore, 1865 - Common Yellow Breasted Flat (Fig.2.A)**

According to Larsen B. Torban this is a rare species in the Nilgiris, however, he states that there are six specimen deposited in British Museum Natural History. He himself and Wynter-Blyth have both taken only two specimens each from 750 meters elevation at moist temperate terrain. However, in the present study period, the species have been recorded recently from a very high elevation at semi evergreen terrain in the Nilgiris. It was observed on a cloudy day perching under the leaf of *Solanum violaceum* Ortega (Solanaceae).

Status: Very rare

Specimen examined by: *VK Chandrasekharan, Manoj, Jeevith and Ramesh*

Location: Chembakara (11°20' 58 N & 76°51' 28 E) at 1160 m, Coonoor.

Habitat: Moist and semi evergreen forest

***Arnetta mercara* Evans, 1932 - Coorg Forest Hopper (Fig.2.B)**

According to Winter-Blyth, (Hampson, 1888), (*Astictopterus jama*) had stated that this is an extremely rare species in the

Nilgiris, but sometimes could be found in Nadugani Ghat and endemic to the Western Ghats (Larsen, 1987; Mathew, 1994). However neither Wynter-Blyth nor Larsen were able record it. Recently, the species has been recorded from Madhuvana Estate, Devala (Rohit Girotra, 2014, IFB) and during the present study period from Pandiyar Estate, Gudalur in Mar 2017. In Pandiyar, it was observed basking in the evening on the dorsal leaves of *Solanum torvum* Sw., (Solanaceae).

Status: It is still found to be very local and very rare in the Nilgiris.

Specimen examined by: *Manoj*

Location: Pandiyar Estate, Ponnumpuzha river banks (11° 27' 22 N & 76° 30' 17 E) at 1180 m, Gudalur.

Habitat: Moist deciduous forest

Family: Lycaenidae

***Hypolycaena nilgirica* Moore, 1883 - Nilgiri Tit (Fig.2.C)**

Larsen (1987) reports that the first specimen of the Nilgiri tit was caught in Nilgiris just about one hundred years ago by Mr. A. Lindsay (Hampson, 1888). It was later collected also in the Pulney hills and a few specimens turned up in Sri Lanka. While Hampson did not record it, the specimens found by Wynter-Blyth & Larsen are from a very lower elevation (600 m msl). It has now been recorded from 900± elevation on the Geddhai slopes. It was found mud-puddling near a rivulet.

Status: The species are still found to be very rare in the Nilgiris.

Specimen examined by: *Manoj, Vinod and Jeevith*

Location: Geddai slopes (11°14' 50 N & 76°40' 25 E) at 905 m, Manjoor.

Habitat: Moist deciduous forest

***Rapala varuna* Horsfield, 1829 - Indigo Flash (Fig.2.D)**

Hampson (1888) Indigo Flash (*Rapala lazulina*, Moore) states the species is common in 600 – 1200 meters msl in Western Slopes of Nilgiris. Wynter-Blyth (1943) could get only a specimen of male, in dull and darker shot blue with shining blue on the upper and lower wings from Nadugani. Larsen (1987) collected three females in an elevation of 1100 meters msl at Coonoor and Kotagiri Ghats in Nilgiris. Contrary to erstwhile records, the species was recorded from Lambs Rock, basking on tea leaves in the bright evening sun. It was also sighted in the Geddhai slopes basking on tree top. Though Hampson claims it to be common, it has always been rare, even in recent years.

Status: Rare

Specimen examined by: *Manoj, Ramasamy Kamaya & Vinod*
Location: Lambs rock (11°21' 10 N & 76°50' 10 E) at 1745 m, Coonoor.

Habitat: Shola and evergreen forest

***Ancema blanka argentea* Aurivillius, 1898 - Silver Royal (Fig.2.E)**

The first record of *Ancema blanka argentea* is in 1941 at Nilgiris, reported by Wynter-Blyth (1943). Captain Morrison-Godfrey's records of 1941 are doubtful as to *Pratapa deva* or *P. jehana*. Larsen failed to record it and states it is rare to very rare in the Nilgiris (Larsen, 1987; Mathew, 1994). During the present study, the specimen was recorded in Kunjappanai in 2015; it was found basking on twig. The species is found to be very rare at higher elevations.

Status: Very rare

Specimen examined by: *Ramesh and Ramasamy Kamaya*

Location: Kunjappanai (11°21' 30 N & 76°55' 48 E) at 1030 m, Kotagiri.

Habitat: Moist evergreen forest

***Thaduka multicaudata* Moore, 1878 - Many-tailed Oakblue (Fig.2.F)**

A rare to very rare butterfly species in the high altitude of Nilgiris (Larsen, 1987; Mathew, 1994) and prefers riparian vegetation in forest edges. Mostly found in Western slopes of the Nilgiris (Wynter-Blyth, 1943). During this present study, it was found ovi-positing on its host *Trewia nudiflora* L., (Euphorbiaceae) on the typical riparian tract at Ponnumpuzha. Status: It is found to be very rare in higher elevations of the Nilgiris.

Specimen examined by: *Manoj*

Location: Ponnumpuzha (11° 27' 22 N & 76° 30' 17 E) at 1180 m, Gudalur

Habitat: Moist deciduous forest

***Rachana jalindra* Horsfield, 1829 - Banded Royal (Fig.2.G)**

Hampson (1888) (*Sithon indra* Moore) recorded it at 610 to 1525 meters msl in Nilgiris. Wynter-Blyth (1943) collected two specimens, of which one female from Ketti in 1981 meters msl in June (which is curious according to Larsen) and male from Burliyar at 762 meters msl in April the same year. Larsen failed to record it and states it could be mostly found on the underside of leaves and very rare in South India (Larsen, 1987; Mathew, 1994). During this study, it was recorded basking on *Cinnamomum zeylanicum* (Lauraceae) leaf closer to its host *Taxillus cuneatus* (Heyne ex Roth) Danser., (Loranthaceae) a parasitic plant on silk cotton tree near Walwood estate.

Status: Rare

Specimen examined by: *Manoj*

Location: Walwood Estate (11°20' 20 N & 76°49' 55 E) at 985 m, Coonoor slopes.

Habitat: Semi-evergreen forest

***Horaga onyx cingalensis* Moore - Common Onyx (Fig.2.H)**

A very rare butterfly species in the Nilgiris was sighted after 127 years after Hampson (1888). Wynter-Blyth & Larsen failed to record it. The earliest report of about nearly thirty specimens of *Horaga* species caught by Hampson, which he claims "the dark ones are *Horaga viola* males and all the blue ones are *H. onyx* females and males with secondary sexual characters on the forewing and the Nilgiri form would be a distinct species, but proof is wanting". During the present study period, the species have been recorded in two

consecutive years. The first at Lambs Rock in (April, 2015) perching under the leaves of *Acronychia pedunculata* (L.) Miq., (Rutaceae) later it was found at Kunjappanai (March, 2016) basking on *Terminalia bellirica* (Gaertn.) Roxb., (Combretaceae) tree top. It was once again sighted from Lambs Rock (May, 2016) in the same tree *Acronychia pedunculata* (L.) Miq., (Rutaceae) around 3.30 pm, in the evening. Though Hampson claims it to be common it is found to be very rare in the Nilgiris, however its range is not restricted to Western Slopes alone but also extends to Southern and South-East slopes of the Nilgiris.

Status: Rare

Specimen examined by: *Jeevith, Ramesh, Ramasamy Kamaya and Manoj*

Location: Kunjappanai riparian forest (11°21' 40 N & 76°55' 40 E) at 850 m, Kotagiri; Lambs rock (11°21' 10 N & 76°50' 10 E) at 1745 m, Coonoor.

Habitat: Moist evergreen and Shola forest

***Catapaecilma major callone* Fruhstorfer - Common Tinsel (Fig.2.I)**

Hampson (1888) reported Common Tinsel (*Catapaecilma elegans*, Druce) from the Western slopes of the Nilgiris at 600 - 1200 meters msl. According to Larsen, though Hampson called it 'common' the Common Tinsel appears to be relatively scarce in the Nilgiris. He also states S. Imber found a thriving colony at Kunjappanai area. Larsen (1987) collected two specimens in widely separated spots in the Nadugani in 1986 and St. Catherine's falls in Kotagiri at 1600 meters msl in 1956. Wynter-Blyth failed to record it. During the present study period, the species was recorded at O'valley estate in a marshy swamp area in December 2015.

Status: Very rare.

Specimen examined by: *Ramesh, Manoj, Jeevith and Vinod*

Location: O'valley (11°26'45 N & 76°28' 04 E) at 950 m, Gudalur

Habitat: Moist evergreen forest with swamps

Family: Nymphalidae

***Euripus consimilis* Westwood, 1850 - Painted Courtesan (Fig.3.J)**

Painted Courtesan *Euripus consimilis* is a very rare species in Nilgiris. Hampson found one in *Lantana camara* at North-west of Nilgiris in October, 1888. Wynter-Blyth took one specimen from a much lower elevation. According to Larsen, a pair of species had taken in Droog division in Nilgiris by Meinertzhagen in 1890, now in the British Museum, Natural History. Larsen (1987) himself took one female in the forest below Glenburn estate and also seen a photographed specimen from Nadugani in Japanese collection. During this study, it was seen basking at De Rock Resorts, Lambs Rock, Coonoor in 2016, it was again sighted in 2017 in the same locality. The recent sightings of Painted Courtesan *Euripus consimilis* is after 30 years in the Nilgiris.

Status: Very rare

Specimen examined by: *Charles Nathen*

Location: Lambs rock (11°21' 20 N & 76°50' 05 E) at 1750 m, Coonoor

Habitat: Shola and Evergreen forest

***Ypthima philomela tabella* Marshall & de Niceville - Baby Fivering (Fig.3.K)**

According to Hampson (1888) Baby Fivering *Ypthima philomela tabella* is common at the North-West corner of the Nilgiris in the Wayanad boundary. But Larsen has failed to

record it. Wynter-Blyth (1943) had sighted one dry season form specimen from Ben Hope in Mettupalayam Ghat, though it was very difficult to identify. According to Mathew (1994) it is an extremely rare and endemic species to Western Ghats. The species were sighted in the Southern Slopes at Chembakara village perched on *Parthenium* bush. The recent finding clearly shows the double-pupilled black apical eyespot with a broad yellow ring on under forewing. It has been authenticated after 73 years from Nilgiris.

Status: Rare

Specimen examined: *VK Chandrasekharan, Jeevith, Manoj* and *Ramesh*

Location: Chembakara (11°20' 58 N & 76°51' 28 E) at 1160 at msl, Coonoor.

Habitat: Moist and semi-evergreen forest

***Neptis nata hampsoni* Moore - Clear Sailor (Fig.3.L)**

According to Hampson it is found in 900 – 1220 meters msl and the width of white bands on the underside in these species *N. nata* and *N.nadina* varies much and though *N. nandina* is larger. According to Wynter-Blyth this could be found in small numbers in all of the evergreen forests including the sholas. Larsen (1987) had taken it at Longwood Shola, Kotagiri and also in Nadgani Ghat. It is an extremely rare species (Mathew, 1994). The species was taken on the Kurumbadi, Coonoor slopes in flight at close quarters.

Status: Rare

Species examined by: *Manoj, Jeevith, Gnaneshwar* and *Ramasamy Kamaya*

Location: Kurumbadi (11°20' 10 N & 76°49' 45 E) at 990 m, Coonoor

Habitat: Semi evergreen forest

***Neptis soma palnica* Eliot - Sullied Sailor (Fig.3.M)**

According to Hampson (1888) (*Neptis kallaura* Moore) is to be found in 900 - 1200 meters msl and an extremely rare and endemic to Western Ghats (Mathew, 1994). Wynter-Blyth (1943) took a single specimen from Nadugani Ghat in October. The specimen was found in Lambs Rock basking on tea leaves in bright morning sun.

Status: Very rare

Specimen examined by: *Charles Nathen*

Location: Lambs rock (11°21' 20 N & 76°50' 05 E) at 1750 m, Coonoor

Habitat: Shola and Evergreen forest

***Ypthima striata* Hampson, 1889 - Striated Fivering (Fig.3.N)**

Striated Fivering *Ypthima striata* is rare species and also known as Jewel fourring, mostly in Southern slopes of Nilgiris between 900-1200 meters msl according to Hampson. A single male specimen was sighted from Burnside Estate in 1400 meters msl by Larsen (1987). The species was not taken by Wynter-Blyth, after 30 years of sighting by Larsen the species was recorded from the Pakkasuran Hills (January 2017), soon after it was sighted at Kallhatty Ghats (May 2017), it was again sighted in the Geddhai slopes in (Jun 2017). Though it is an uncommon species, the sightings in different elevations and terrain shows its abundance in the Nilgiris. It mostly occurs in lithophytic habits with terrestrial herbs and grasses.

Status: Rare

Specimen examined by: *Jeevith, Manoj* and *Vinod*

Location: Pakkasuran Hills (seen); Kallhatty Ghats (11°30' 04 N & 76°40' 25 E) at 1095 m, Kallhatty; Geddai (11°14' 50 N

& 76°40' 25 E) at 905 m, Manjoor.

Habitat: Moist deciduous forest



Fig 2: A. Common Yellow Breasted Flat *Gerosis bhagava*, B. Coorg Forest Hopper *Arnetta mercara*, C. Nilgiri Tit *Hypolycaena nilgirica*, D. Indigo Flash *Rapala varuna*, E. Silver Royal *Ancema blanka argentea*, F. Many-tailed Oakblue *Thaduka multicaudata*, G. Banded Royal *Rachana jalindra*, H. Common Onyx *Horaga onyx cingalensis*.

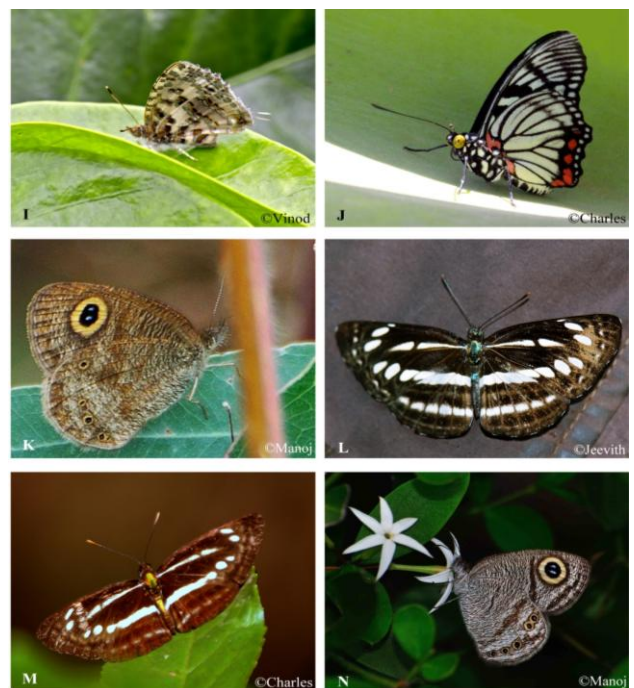


Fig 3: I. Common Tinsel *Catapaecilma major callone*, J. Painted Courtesan *Euripus consimilis*, K. Baby Fivering *Ypthima philomela tabella*, L. Clear Sailor *Neptis nata hampsoni*, M. Sullied Sailor *Neptis soma palnica*, N. Striated Fivering *Ypthima striata*.

5. Conclusion

The sighting of the above fifteen rare species in the Nilgiris from 2013 to 2017 shows that many species which were not seen by Larsen, have been sighted and either 70 years after Wynter-Blyth or Hampson after 130 years. All the rare species continue to be rare in the Nilgiris, except that in some cases the range has been extended drastically. Continues efforts by way of regular surveys may produce unimaginable results in the rediscovery of species like the illustrious *Spindasis abnormalis* Abnormal Silverline. Concerted and coordinated efforts by amateurs, forest department, scientists, student community & common man can pave the way and means to identify, consolidate and conserve this treasure for posterity.

6. Conflict of Interest: The authors declare no competing interests.

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