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New records of white-line bushbrown *Heteropsis malsara* Moore (Lepidoptera: Nymphalidae) and obscure branded swift *Pelopidas agna* Moore (Lepidoptera: Hesperidae) from Uttarakhand

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Abstract

The present article confirms that two new butterflies: White-line bushbrown *Heteropsis malsara* (Moore, 1857) and Obscure branded swift *Pelopidas agna* (Moore, [1866]) reported for the first time for the state Uttarakhand of India. These butterflies are recorded during a two day survey, which was carried out from 14 to 15 October, 2018 in the Nandhaur Wildlife Sanctuary (NWLS) of Uttarakhand state. The study area was represented by tropical moist deciduous forest ecosystem and has numerous streams inside it and water fills them up during the summer. A single individual of white-line bushbrown *Heteropsis malsara* was observed near a water stream on October 14, 2018, at 11:00 hrs (IST) in Machli van, NWLS. The second species, obscure branded swift *Pelopidas agna* was photographed the same day near a forest track made of sand and gravel at 13:00 hrs (IST) approximately 200 meters apart from the site where white-line bushbrown has been recorded. Both the species were photographed from different angles to obtain enough photographs to confirm identification of the species. These two new sighting records signify previous sampling gaps and suggest further survey to make a baseline database and take effective initiatives for conservation to protect the butterfly fauna in this area.

Keywords: Nandhaur wildlife sanctuary, NWLS, *Heteropsis malsara*, *Pelopidas agna*, Nainital, Machli van

1. Introduction

Uttarakhand, a hilly state of India, shares border with China (Tibet) in the North and Nepal in the East and interstate boundaries with Himachal Pradesh in the West, Northwest and Uttar Pradesh in the South. It has diverse geographical features ranging from snow-capped mountain peaks in the North to tropical forests in the South; its climate and vegetation vary accordingly and thus has varied fauna included a rich heritage in butterflies. Evans ^[2] have recorded approximately 450 species of butterfly from this region. Recent rediscoveries and many reports of range extensions for several species of butterflies indicate that there is immediate need to survey this faunal group in Uttarakhand. Some of the butterflies which were recently reported from this hilly state are *Delias acalis* Godart ^[12], *Pontia daplidice* Linnaeus and *Pontia glaucanome* Klug ^[13], *Poritia hewitsoni* Moore ^[7], *Ampittia dioscorides* Fabricius ^[8], *Talica niseus* Guérin Menéville ^[9], *Zesius chrysomallus* Hübner ^[10], *Nacaduba kurava* Moore, *Flos asoka* de Nicéville & *Arhopala abseus indicus* Riley ^[14], *Matapa sasivarna* Moore ^[5] and *Anthene emolus* Godart & *Caltoris kumara* Moore ^[6]. The current two day survey, carried out from 14 to 15 October, 2018, is part of a larger assessment of the diversity and status of rare butterflies in Nandhaur Wildlife Sanctuary of Uttarakhand. The present paper decisively confirms the presence of White-line Bushbrown *Heteropsis malsara* Moore (Lepidoptera: Nymphalidae) and Obscure Branded Swift *Pelopidas agna* Moore (Lepidoptera: Hesperidae) as a new geographical extension of their distribution in Uttarakhand.

2. Materials and Methods

2.1 Study area

The present study was carried out in a sufficiently large portion of the Nandhaur Wildlife Sanctuary (Fig. 1). This sanctuary lies between river Gola & river Sarada and intersected by river Nandhaur, which flows east to west in the northern area. It covers an area of 269.96 km². The NWLS is located mainly in the Nainital & Champawat and partly in Udham Singh Nagar district of Uttarakhand state.

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The majority of the NWLS lies in Haldwani forest division of Nainital district. Geographically, most of the portion of this sanctuary situated in the region of alluvial plain, called Bhabar. The NWLS is a very rich area in terms of biodiversity. The area has more than 100 species of trees, 30 species of shrubs and 20 species of climbers and grasses. The area has 27 different forest types and sub-types when classified according to the Champion and Seth forest classification. The area is predominately Sal forest (*Shorea*

robusta) covering about 70% of its area. Besides it, it also has Shisham (*Dalbergia sissoo*), bamboo (subfamily *Bambusoideae*), Teak (*Tectona grandis*), Chir pine (*Pinus roxburghii*) and riverine forest. Due to its diverse plant wealth, it supports high butterfly diversity and species richness. The area is also home to about 25 species of mammals, 250 species of birds, 15 species of reptiles and 20 species of fishes.



Fig 1: Study area shown by the white rectangle with particular sites marked as 1 and 2 (Site 1 & 2: Where Obscure Branded Swift *Pelopidas agna* and White-line Bushbrown *Heteropsis malsara* were photographed, respectively). Courtesy- Imagery ©2018 Terra Metrics, Map data ©2018 Google. 3.

2.2 Methodology

The present survey was carried out at various spots within the study area by point and line transect methods (Barhaum *et. al.*, 1980-1981) [1]. The number of individuals encountered along the line transect were counted and details of location/site, activities, date, habitat, altitude and GPS coordinates were noted for each species. During the survey, White-line Bushbrown *Heteropsis malsara* and Obscure Branded Swift *Pelopidas agna* were recorded and photographed by a digital single-lens reflex (DSLR) camera using a 70–300 mm lens. A single specimen of each of the species was caught, using an entomological net, for identification and measurement. After documentation, the specimens were released immediately, without damage. Identifications were confirmed with the help of literature by Evans (1932) [2], Wynter-Blyth (1957) [17] and Kehimkar (2016) [4].

3. Results and Discussion

3.1 White-line Bushbrown *Heteropsis malsara* (Moore, 1857)

This is a small butterfly belonging to the Nymphalidae family. There are no subspecies listed under this species. The global distribution of this species in Bhutan and Myanmar [4]. In India, it is found in Odisha, Sikkim and northeast India [16]. It is listed as common by Paul Van Gasse [3] from Orissa (now Odisha), central Nepal and adjacent north Bihar to Arunachal, northeast India, southeast Bangladesh, Burma to Rangoon and Tavoy. Evans [2] listed the distribution of this species as “Sikkim-Rangoon”. However, there are no published records of this species from Uttarakhand; hence this record extends its

range further westwards. A single individual of White-line Bushbrown *Heteropsis malsara* was photographed, when it was mud-puddling along a densely wooded stream through a deciduous forest. This sighting was made at 11:00 hrs (IST) on October 14, 2018 in Machli van, NWLS, Uttarakhand (29° 8' 12.98" N and 79°42' 15.17" E). This record of *Heteropsis malsara* in Machli van, Nandhaur Wildlife Sanctuary extends its range by more than 500km westwards from Kaski district, central Nepal [15] and hence the possibility of the presence of this butterfly between central Nepal and Uttarakhand cannot be ruled out. It also offers support to the putative role as link habitat between central Himalaya and western Himalaya.

3.2 Obscure Branded Swift *Pelopidas agna* (Moore, [1866])

Obscure Branded Swift *Pelopidas agna* is a member of the family Hesperidae (Skippers). It has only a single subspecies in India, i.e. *Pelopidas agna agna* (Moore, [1866]). According to Varshney and Smetacek [16], it is distributed from Andaman & Nicobar islands, Jammu & Kashmir, Kerala to Gujrat and West Bengal. Evans [2] described this species as a dry season form of *Baoris mathias mathias*, Small Branded Swift; distributed from Ceylon, Burma and Andaman. There is no previous record of obscure branded swift in the literature or preserved specimens from Uttarakhand [16]. A single individual of Obscure Branded Swift *Pelopidas agna*, was photographed near a forest track made of sand and gravel at 13:00 hrs (IST) on October 14, 2018 in the Nandhaur Wildlife Sanctuary (29° 8' 39.36" N and 79°42' 26.76" E). It was basking on a leaf of a shrub. The present record of *Pelopidas agna* shows that there are gaps in our information on the current distribution of butterfly species in Himalaya.



Fig 2&3: White-line Bushbrown *Heteropsis malsara* (Left) and Obscure Branded Swift *Pelopidas agna* (Right) photographed at Nandhaur Wildlife Sanctuary, Uttarakhand.

4. Conclusion

The tarai region of Uttarakhand state is potentially good habitat for butterflies. This area has not been surveyed very well for butterflies since the colonial period. The particular observations suggest that this area supports a substantial amount of rare butterfly species. This emphasizes the need of proper and systematic surveys in this area. According to Singh and Sondhi ^[11] there are at least 51 species of butterflies, which have no recent records in this small hill state. Most of them are lowland butterflies. In addition, there are 10 species for which records need further verification. Lack of proper attention, limited number of butterfly researchers and lack of awareness are the main reasons behind the uncertainty relating to the status of butterflies in this state particularly in the tarai region. This indicates that this area needs significantly more research work on this faunal group. The records of such species from the area show the importance of conserving lower altitude forest of Uttarakhand. These forests are facing problems of illegal logging and boulder mining, poaching, diversion of forest land for non forestry related development activities and deforestation. Fuel wood extraction is going on regularly and should be stopped. Awareness camps, butterfly meet & walks and seminars should be organized regularly. By giving basic knowledge related to butterflies to local people, they can be encouraged for “Butterfly ecotourism” in their area. It will help in protecting the butterflies and their habitat, along with providing them employment. In short these records are helpful for updating the status and distribution of the butterfly fauna in the Uttarakhand state of India.

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