



NOTES ON THE OCCURRENCE OF *CHITORIA SORDIDA SORDIDA* (MOORE, 1866) (NYMPHALIDAE: APATURINAE) IN TSIRANG DISTRICT, BHUTAN

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Jatishwor Singh Irungbam¹, Meenakshi Singh Chib² & Zdenek Flatynek Fric³

¹ Faculty of Science, University of South Bohemia, Czech Republic 37005

² Department of Science, Mendrelgang Central School, Tsirang District 36001, Bhutan

^{1,3} Institute of Entomology, Biology Centre, Czech Academy of Science, Czech Republic 37005

¹ jatishwor.irungbam@gmail.com (corresponding author), ² chib.meenakshi@gmail.com, ³ zdfric@gmail.com

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Abstract: Observations on the distribution of Nymphalid butterfly, Sordid Emperor (*Chitoria sordida sordida* (Moore, 1866)) in southern Bhutan are presented in this paper. The confirmation is based on four years of observation of species in the warm broadleaf forest of Tsirang during July to October. The species is legally protected under Schedule II of the Indian (Wildlife) Protection Act, 1997.

Keywords: Barsong, Mendrelgang, southern Bhutan, Warm broadleaf forest.

The genus *Chitoria* Moore, 1896, is widely distributed throughout the palearctic and oriental regions. The genus consists of 10 species: *sordida* (Moore, 1866) (southwestern China, northeastern India (Sikkim, Naga Hills)), *ulupi* (Doherty, 1889) (western China, northeastern India (Assam, Naga Hills, Manipur), northern Myanmar), *fasciola* (Leech, 1890) (western and central China), *pallas* (Leech, 1890) (southern to eastern China), *subcaerulea* (Leech, 1891) (Taiwan), *modesta* (Oberthür, 1906) (southwestern China),

chrysolora (Fruhstorfer, 1908) (Taiwan), *naga* (Tytler, 1914) (Nagaland, southern Myanmar, northern Yunnan, northern Thailand to northern Laos), *cooperi* (Tytler, 1926) (Myanmar) and *leei* Lang, 2009 (central China). The species *sordida*, *naga* and *ulupi* are present in northeastern India (Sikkim, Naga Hills and Manipur) (Masui 2004; Masui et al. 2011; Lang 2012; Inayoshi 2016).

Tytler (1914) originally described *Chitoria naga* as subspecies of *C. sordida* from the Naga Hills. Later Masui (2004) separated the *C. naga* from *C. sordida* based on geographical variations that *C. sordida* flies at much lower altitude (500m) in Sikkim and Manipur to northern Myanmar while *C. naga* flies at higher altitude (1000–2000 m) in Nagaland, southern Myanmar, northern Yunnan, northern Thailand to northern Laos. Other features which separate *C. naga* from *C. sordida* include the oblique discal band of the FW which is pale yellow in the former; the tornal ocellus on the HW being

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Jihočeská univerzita
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University of South Bohemia
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not ringed and indistinct; underside of the wing being much greyer than *sordida* with a golden sheen along the terminal area; forewing ocellus with a blue center and the cell is closed by a brown bar; the hindwing discal band very concave near the costa and white spots outwardly further placed from discal band than in *sordida* (Antram 1924; Amnuay 2006).

C. sordida ranges across northeastern India (Sikkim, Darjeeling, Assam, and Manipur) to northern Myanmar (Moore 1865; Tytler 1914; Antram 1924; Kehimkar 2008). The species is represented by two subspecies; *C. sordida sordida* (Moore, 1866) and *C. sordida vietnamica* Nguyen, 1979. The subspecies *vietnamica* is reported from northern Vietnam to eastern Laos and Thailand at altitudes above 1000m and subspecies *sordida* is reported from Sikkim, Bhutan, Manipur to northern Myanmar at a much lower altitude of 500m (Masui 2004). Wangdi & Sherub (2012) have also reported the species from Bhutan but the data is dubious because the authors have not mentioned the locality, habitat or the altitude of their record of the species. Singh & Chib (2014) also reported the species from Mendrelgang and seen common during October. However, it is appropriate to note that southern Bhutan shares a border with Sikkim, Darjeeling (West Bengal) and Assam states of India, hence this record is not surprising. In this note, we report the species *C. sordida sordida* from Mendrelgang and Barsong division of Tsirang District in Bhutan, based on several individuals recorded consistently over a period of four years between September 2012 and September 2015.

MATERIALS AND METHODS

To study the species diversity and abundance of butterflies to identify butterfly prime areas (BPA) of Tsirang District, we have been extensively surveying butterflies throughout Tsirang District for the past four years (September 2012 to September 2015). As part of this long term butterfly documentation and monitoring program, we conducted butterfly surveys at seventeen different locations in Tsirang District of Bhutan. The species *C. sordida sordida* was first sighted from Mendrelgang division (Image 1) during September 2012 and regularly sighted in the same locality in the succeeding years of survey. Later in May 2015, the butterfly was sighted at Barsong division, which was the second known locality in Tsirang District. Details of all the sightings are provided below. A few specimens were collected during the study to confirm the sex and subspecies. The studied specimens are deposited at the Invertebrate Referral Collection Centre (IRCC), National Biodiversity Centre, Thimphu, Bhutan.

RESULTS AND DISCUSSION

The subspecies *C.s. sordida* has been regularly sighted in Mendrelgang (26°56'58.38"N & 90°06'44.24"E, 1231m; 26°56'57.35"N & 90°06'43.217"E, 1247m; 26°56'56.61"N & 90°06'42.94"E, 1246m) (Image 1) between September 2012 and September 2015 [30.ix.2012 (2 females); 14.x.2012 (1 male); 20.x.2012 (3 males & 1 female); 28.vii.2013 (1 female); 05.viii.2013 (2 males); 14.x.2013 (1 male); 16.x.2013 (1 male); 29.x.2013 (1 male & 2 females); 03.viii.2014 (1 female); 17.viii.2014 (2 females); 29.viii.2014 (1 male); 23.ix.2014

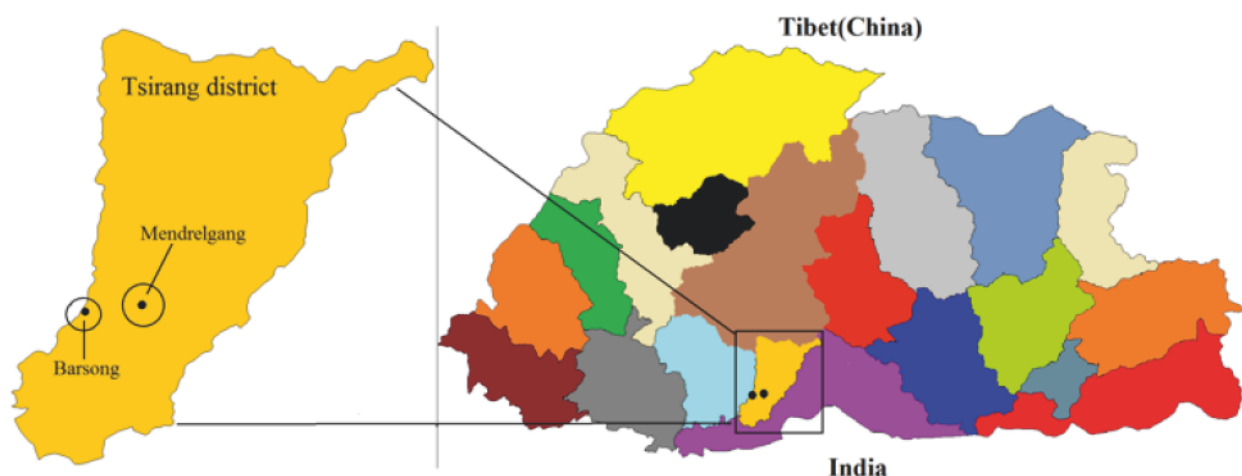


Image 1. Map of Bhutan showing the study area (Tsirang District) of the project and sighting sites of *C. s. sordida* at Mendrelgang and Barsong division.

Image 2. *C. s. sordida* (male)Image 2. *C. s. sordida* (female)Image 4. A sun basking female of *C. s. sordida*Image 5. A mud puddling female of *C. s. sordida*

(9–10 individuals); 25.ix.2014 (2 males & 1 female); 04.x.2014 (1 male); 05.x.2014 (4 females); 12.x.2014 (1 male); 23.viii.2015 (3 females & 2 males); 29.viii.2015 (1 female & 2 males); 10.ix.2015 (1 female)] (Images 2–8). They were observed feeding on the sap of orange trees where the bark had been gorged open by beetles, or were observed basking in the canopy. The species was also seen mud-puddling on the wet rocks on some occasions. They were found flying in the vicinity of the orange orchard, wild banana plantation, nearby streams but they generally avoided heavily forested areas. Usually they were found feeding on sap along with other nymphalid butterfly species like *Stibochiona nicea*, *Herona marathus*, *Rohana parisatis*, *Mycalesis francisca sanatana*, *Kallima inachus*, *Vanessa cardui*, *V. indica*, *Bassonara durga*, *Polyura athamas* and *Euthalia phemius* (14.x.2012; 29.viii.2014; 25.ix.2014; 05.x.2014). The species is rare in all its distribution ranges but locally common in Tsirang (Evans 1927; Masui 2004; Kehimkar

2008). The species are found here between August to October, apparently as only one brood, though records of the species from other parts of its range seem to indicate a longer flight period from April to November (Kehimkar 2008). In the study area, it seemed that they form colonies near orange orchards avoiding thick forests surrounded by *Bamboo* sp., *Celtis* sp., *Ficus* sp., *Passiflora* sp., wild Banana and Cardamom plantation.

The species has been observed also from Barsong division (26°56'37.18"N & 90°3'52.678"E, 506m (Image 1) on 24.v.2015 where a single male was found basking on the grass near forest. This sighting was surprising because most of the sightings of this species were above or around 1247m. These facts contrast with the current experience as only the record from Barsong is in a known altitudinal range, whereas the majority of the Mendrelgang records is from a much higher altitude (1247m), the same as are known for *C. naga* (Masui 2004; Amnuay 2006; Kehimkar 2008). Thus, the recent



Image 6. Female of *C. s. sordida* in the collection of Invertebrate Referral Collection Centre, NBC, Thimphu - IRCC/653 (UP).



Image 7. Female of *C. s. sordida* in the collection of Invertebrate Referral Collection Centre, NBC, Thimphu - IRCC/653 (UN).



Image 8. Female of *C. s. sordida* in the collection of Invertebrate Referral Collection Centre, NBC, Thimphu (UN).

sighting confirms that the species *C. sordida sordida* also flies at much higher altitude like *C. naga*. Hence, the present sightings are quite important and this record gives an insight into its distribution range and habitat in southern Bhutan.

CONCLUSION

Since the species occurs in southern Bhutan at this altitude, it could be found potentially in other parts of Bhutan and northeastern India as well, at similar altitudes, thus a revision of the altitudinal distribution of this species is suggested. Also, the discrepancy between the flight period, i.e., August–October in Mendrelgang and May at Barsong is interesting and needs more attention. We do not have a clear idea of its distribution, thus we are yet to generate a distribution map.

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