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First sighting records of four butterfly species (Lepidoptera: Rhopalocera) from Chintamani Kar Bird Sanctuary, 24 Parganas (South), West Bengal, India

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Abstract

The paper reports new citation record of four butterfly species, Tricolour Pied Flat (*Coladenia indrani* Moore, 1865), Smaller Dartlet (*Oriens goloides* Moore, 1881), Bengal Tree Flitter (*Hyarotis adrastus* Stoll, 1782), Banded Treebrown (*Lethe confusa* Aurivillius, 1898), for the first time from Chintamani Kar Bird Sanctuary, (District 24 Parganas (South), West Bengal).

Keywords: Butterfly diversity, Chintamani Kar Bird Sanctuary, Lepidoptera, new record.

Introduction

It is difficult to speculate how climate change and an array of anthropogenic factors including habitat destruction due to factors like industrialization, urbanization and agricultural intensifications will influence the biodiversity causing shift in distribution and abundance of species leading to changes in structure and function of ecosystems ^[1]. To understand the habitat needs and safeguarding the biodiversity, frequent and regular field work is required, with accurate data particularly of the macro and micro habitats where bioindicator species like butterflies are thriving ^[2, 3]. Due to their narrow microclimate preferences, including adult nectaring and larval host plants; and interspecific differences in optimum temperature and humidity, butterflies are considered as excellent indicators of habitat changes ^[4]. Studies by Lee *et al.* ^[5] shows that butterflies are more susceptible to climate change when adapting to the unprecedented local environments and expanding their original temperature range for survival, thus having to shift their range.

During the course of a number of butterfly photography walk conducted at Chintamani Kar Bird Sanctuary, (District 24 Parganas (South), West Bengal in the year 2017, we sighted and photographed four species of butterflies for the first time in this area.

Materials and Methods

Study Area

The study was conducted at Chintamani Kar Bird Sanctuary (CKBS), Narendrapur, 24 Parganas (South) (22.4293° N, 88.4007° E) in the winter and pre-monsoon seasons of the year 2017. CKBS (Figure 1) is the only protected area in the state within the city limits. It is a paradise spread across 17 acres, for range of floral and faunal diversity including several migrant species. The average temperature of the sanctuary range from 13° (winter) to 37°C (summer), RH: 57 (minimum) to 91% (maximum).

Sampling technique

Periodic surveys were conducted at CKBS to obtain information on butterfly diversity through photographic documentation of the sanctuary. Four butterfly species were observed for the first time at CKBS. Images of the four species reported were taken using two different cameras (Nikon DSLR 5300, with Nikon lens of 55-300mm and Canon PowerShot SX50 HS) being carried by authors. The species were confirmed based on external morphology with reference to available literature ^[6, 7]. Previous distribution of butterfly species were confirmed from Kunte *et al.* ^[8].

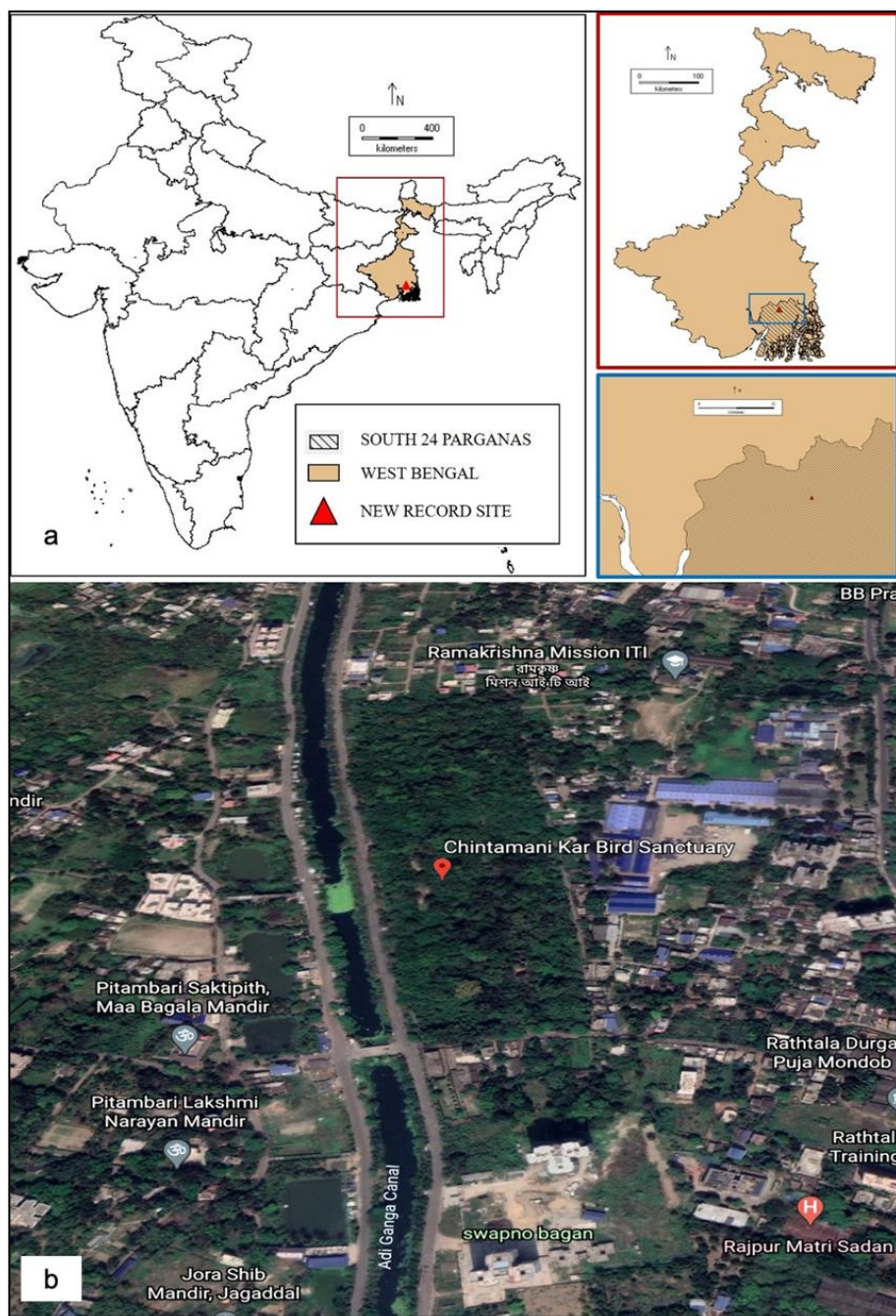


Fig 1: (a) Map of India showing location of Chintamani Kar Bird Sanctuary (CKBS), Narendrapur, 24 Parganas (South) (b.) A satellite overview (Google earth) map showing the location of the study area

Results

Description of Species with new distributional records

Tricolour Pied Flat (*Coladenia indrani* Moore, 1865)

Class: INSECTA

Order: LEPIDOPTERA

Family: HESPERIDAE

Subfamily: PYRGINAE

Genus: *Coladenia*

Description: The upper side of the wing possesses a bright golden-yellow hue (Figure 2). A discal row of four semi-transparent black-bordered white spots are present on the forewing, the first of which is small, lying above the edge of the cell, the second is a large quadrate, lying within the cell, the third spot runs extended and situated underneath the latter, and the fourth one is situated outside to their juncture. Beneath these is a pale golden-yellow spot bordered by a black outline. Before the apex lies a series of four similar

white spots with black border. The upper three spots are conjugated-a distinct black spot close to the base. The outermost margin and cilia are of blackish colour, the latter is white at the posterior angle. The hind wing possesses a semi-circular submarginal group of black spots and two similar inner discal spots; exterior rim is black; cilia are alternatively white and black. The wing underside is blackish-brown suffused with golden-yellow, most prominent on the hindwing and the markings clearly distinguished. The thorax, body, palpi (except tip, which is black), and legs are yellow. Antennae is yellow, with a black tip^[9].

Distribution: The species has been reported earlier from Chhattisgarh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya and Tripura. The subspecies under consideration was recorded in Uttarakhand. In West Bengal, it has been recorded from Buxa Tiger Reserve, Alipurduar. *Coladenia indrani* has not been

observed in Southern part of the state This species has no district records. Distribution record is given in figure 6.



Fig 2: Tricolour Pied Flat (Moore, 1865)

2. Smaller Dartlet (*Oriens goloides* Moore, 1881)

Class: INSECTA

Order: LEPIDOPTERA

Family: HESPERIDAE

Subfamily: HESPERIINAE

Genus: *Oriens*

Description: Upperside of the wing is deep purple-brown (Figure 3). Sexual dimorphism present. In the male, a golden-yellow oblique discal sinuous band is present in the forewing, accompanied by minute costal spots situated before the apex; the base of the costa and cell, and two spots at its end are also golden-yellow colour. A discal sinuous golden-yellow band runs medially across the hindwing. The fuzzy scales reach up to the base and are yellow. Cilia have golden yellow colouration. The wing underside possesses less distinguished markings as above: costa and apex of the forewing and the hindwing are suffused with yellow. The body and legs are golden-yellow, the palpi and front of thorax under are saffron-yellow in colour. In the female, the wing morphology varies only in the discal band is narrow, and without the yellow costal strip. Wingspan: 25-28 mm^[9].

Distribution: The species has been reported from parts of Kerala, Karnataka, Odisha, Sikkim, Tamil Nadu, Assam, Uttarakhand, Goa, and West Bengal (Alipurduar). Distribution record is given in figure 6.

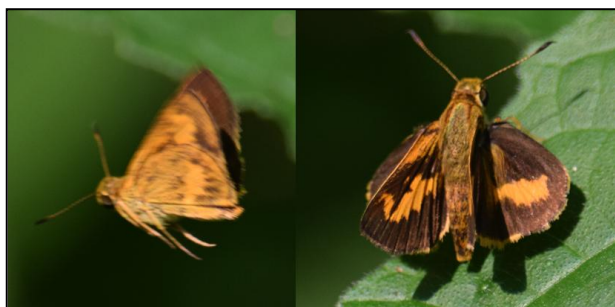


Fig 3: Smaller Dartlet (*Oriens goloides* Moore, 1881)

3. Bengal Tree Flitter (*Hyarotis adrastus* Stoll, 1782)

Class: INSECTA

Order: LEPIDOPTERA

Family: HESPERIIDAE

Genus: *Hyarotis*

This species is legally protected in India under Schedule IV of the Wildlife (Protection) Act, 1972.

Description: The wings of both male and female forms are a deep chocolate-brown. Three small conjugated subapical semi-transparent white spots are present on the upper side of the forewing, three similar and more abundant discal spots and a fourth lies above them in the cell. The underside of the wing, near the base, is darker brown, while pale brown outward. Forewing possesses spots as described above. The forewing has a suffused dark brown strip bordering the margin.

A dual series of white dark brown-outer-bordered lunules spans across the middle of the hindwing, exceeding which is a submarginal series of suffused dark brown spots. The palpi, thorax, and abdomen beneath are pale greyish-brown colour, while the legs are brown. Yellowish-white cilia dotted with spots of pale brown colour. Wingspan: 38-48mm^[9].

Distribution: The subspecies under consideration was recorded in Uttarakhand. In West Bengal, records are found in northern regions of the state (Darjeeling District, Alipurduar District) as well as in Southern part of the state (Howrah District, Hugli District, Nadia District). Distribution record is given in figure 6. This species has no district records.

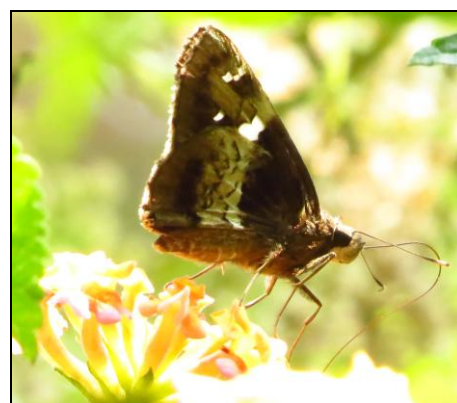


Fig 4: Bengal Tree Flitter (*Hyarotis adrastus* Stoll, 1782)

4. Banded Treebrown (*Lethe confusa* Aurivillius, 1898)

Class: INSECTA

Order: LEPIDOPTERA

Family: NYMPHALIDAE

Subfamily: SATYRINAE

Genus: *Lethe*

Description: The forewing is traversed by an angled, slightly curved, discal white line, the margins of this line is even and regular; beyond this are two obliquely placed pre-apical white spots (Figure 5).

The forewing has an oblique discal white bar like seen on the upperside, followed by a subapical lilacine patch having three small ocelli in vertical order, and with a very short, oblique, white bar joining it to the costa.

The hindwing is dentate at the apex of vein 4. Upperside of the wing a shade of Vandyke brown. The hindwing is uniform, ocelli of the uniformly brown underside can be seen through. It bears a twisted, irregular, discal white line and a strongly arched set of black ocelli speckled with white in the centre, with an inner brownish, and outer lilacine white ring.

The forewings and hindwings possess subbasal, subterminal and terminal twisted white bands.

Antenna, head, thorax and abdomen are dull brown; antennae ochre hued at the top. Wingspan: 54–64 mm ^[10].

Distribution: This species was recorded in one instance at the

location. This species is mostly seen in Himalayan Foothills along Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, and in West Bengal (districts of Darjeeling and Alipurduar). Distribution record is given in figure 6. This species has no district records.



Fig 5: Banded Treebrown (*Lethe confusa* Aurivillius, 1898)

Discussion

The study site CKBS, supports a rich diversity of butterflies accounting wide variety of flora which provide them an ideal breeding habitat. However human encroachment, impact of invasive species, etc ^[11] are disrupting ecosystem integrity thus causing negative impact on the biodiversity of the sanctuary. India has a wide diversity of habitats that are influenced by an equally wide variety of climatic conditions. Today there are about 1,327 known species of butterflies in India. However very little is known

about most of their habitat and life histories including their specific host plant diversities. Many of these species are succumbing to increasing long-term habitat disturbance and global climate changes ^[12]. Our scanty knowledge in these terms compromises our ability to develop and implement effective conservation programmes. Thus more such studies are needed to improve our efficacy to develop and implement effective conservation strategies for these fragile bioindicator species.

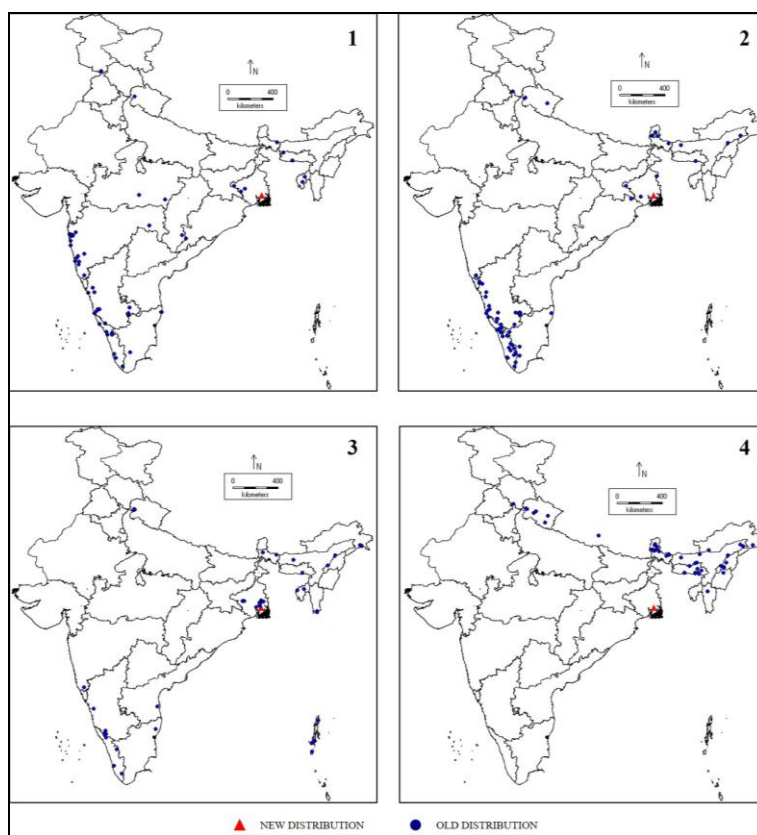


Fig 6: Previous and new record distribution of of four butterfly species, (a.) Tricolour Pied Flat (*Coladenia indrani* Moore, 1865), (b) Smaller Dartlet (*Oriens goloides* Moore, 1881), (c) Bengal Tree Flitter (*Hyarotis adrastus* Stoll, 1782), and (d.) Banded Treebrown (*Lethe confusa* Aurivillius, 1898)

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