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New records of one-spot grass yellow *Eurema andersonii* Moore (Lepidoptera: Pieridae) and common shot silverline *Spindasis ictis* Hewitson (Lepidoptera: Lycaenidae) from Kumaon region of Uttarakhand, India

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Abstract

In this paper, we have documented the two new records of butterflies from the Kumaon region of Uttarakhand, namely One-spot Grass Yellow *Eurema andersonii* Moore, 1886 and Common Shot Silverline *Spindasis ictis* Hewitson, 1865. Both the species were reported from Pawalgarh Conservation Reserve, Ramnagar of Nainital district, Uttarakhand, India. These findings are based on the random surveys carried out in the various parts of Nainital districts from March 2015 to March 2019. During a survey organized in Pawalgarh Conservation Reserve, our attention was caught by a yellow butterfly, which was resting near "Dabaka" river. This sighting was made on 24th April, 2015 at 12:10 hrs (IST), 482 mtr above sea level (asl). It was photographed properly and identified as One-spot Grass Yellow *Eurema andersonii*. The second species, Common Shot Silverline *Spindasis ictis* was recorded during a two day survey carried out from 16th to 17th March, 2019 in Pawalgarh Conservation Reserve. It was sighted near the same river on 17th March, 2019 at 14:30 hrs (IST), 498 mtr above sea level (asl). Both the species were photographed from different angles to obtain enough photographs to confirm identification of the species. These two new sighting records from the Kumaon region 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: Pawalgarh conservation Reserve, Kumaon, *Eurema andersonii*, *Spindasis ictis*, Ramnagar, Nainital

1. Introduction

Uttarakhand, a hilly state of India, comprising the administrative divisions of Kumaon and Garhwal, 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. Kumaon region lies between 28°44' and 30°49' N latitude and 78°45' and 81°5' E longitudes. It rises from the sub-Siwalik bhabar to a "magnificent series of glacier-garlanded peaks". Due its diverse geographical features, climate and vegetation vary accordingly and thus has varied fauna included a rich heritage in butterflies. William Doherty published a list of 271 species of butterflies from the Kumaon region of Uttarakhand in 1886 [2]. F. Hannyngton recorded 378 species of butterflies from the Kumaon region of Uttarakhand during 1910 to 1915 [5-7]. In 2011, four new lycaenid butterfly i.e. Red Pierrot *Talicauda nyseus nyseus* Guérin-Méneville, Transparent Six-line Blue *Nacaduba kurava* Moore, Spangled Plushblue *Flos asoka* de Nicéville & Aberrant Bushblue Riley were reported for the first time from the Kumaon Himalaya [8]. Pale Green Sailer *Neptis zaida bhutanica* Tytler was reported by Smetacek [20] from Thal, Pithoragarh district and Colour Sergeant *Athyma nefte inara* Westwood was reported by Sanjay Chhimwal [20] from Ramnagar, Nainital district; both the species were recorded for the first time from Kumaon region. Besides it, during past 3 to 4 years some independent researchers reported significant records related to the rediscoveries and range extensions for several species of butterflies for Kumaon i.e. *Matapa sasivarna* Moore [9], *Anthene emolus* Godart & *Caltoris kumara* Moore [10], *Gerosis phisara* Moore & *Caleta decidia* Hewitson [11], *Heteropsis malsara* Moore and *Pelopidas agna* Moore [12], *Arhopala bazalus* Hewitson and *Catapaecilma major* Druce [13], *Sinthusa nasaka pallidior* Fruhstorfer [14] etc. The present paper decisively confirms the presence of One-spot Grass Yellow *Eurema*

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andersonii Moore, 1886 and Common Shot Silverline *Spindasis ictis* Hewitson as a new in Kumaon region of Uttarakhand.

2. Materials and Methods

2.1 Study area

The study area Pawalgarh Conservation Reserve situated in the tarai region of Nainital district was represented by tropical moist deciduous forest ecosystem and has numerous streams inside it and water fills them up during the summer. The boundaries of Pawalgarh Conservation Reserve lie between coordinates N 29°22'20.76", E 79°16'56.29" to N

29°23'21.80", E 79°8'13.33" from East to West and ranges between N 29°24'49.08", E 79°11'53.72" to N 29°20'14.86", E 79°13'48.64" from north to south with an area of 5824.76 ha of reserve forest. The altitude of the area varies from 300 to 700 meters above mean sea level. It is located between the Ramnagar-Haldwani Highway and the natural course of the river "Dabka" and river "Kosi". The area is predominately Sal forest (*Shorea robusta*). Besides it, it also has Shisham (*Dalbergia sissoo*), bamboo (subfamily *Bambusoideae*), Teak (*Tectona grandis*) and riverine forest. Due to its diverse plant wealth, it supports high butterfly diversity and species richness.

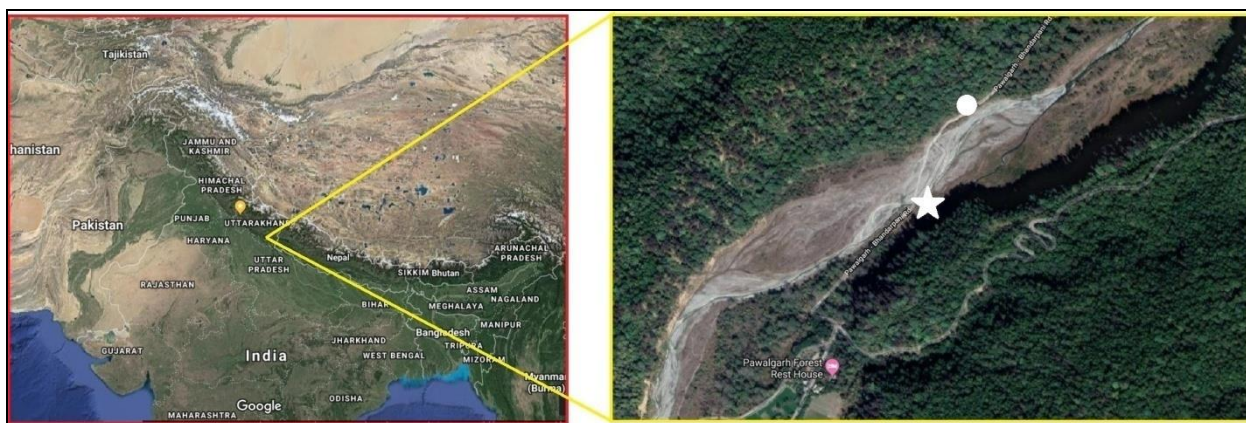


Fig 1: Map of the study area. Star shows the sites where One-spot Grass Yellow *Eurema andersonii* was reported and the site where Common Shot Silverline *Spindasis ictis* was recorded, marked as a white dot. Courtesy- Imagery ©2018 TerraMetrics, Map data ©2018 Google.

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, One-spot Grass Yellow *Eurema andersonii* Moore and Common Shot Silverline *Spindasis ictis* were recorded and photographed by a digital single-lens reflex (DSLR) camera using a 70–300 mm lens. Identifications were confirmed with the help of literature by Evans (1932) [3], Wynter-Blyth (1957) [21] and Kehimkar (2016) [8].

3. Results and Discussion

3.1 One-spot Grass Yellow *Eurema andersonii* (Moore, 1886)

This butterfly belongs to the Pieridae family. It is given as *Terias andersoni* in Evans 1932 [3], where the Andaman subspecies was given as *T. andersoni andamana*; *jordani* and *shimai* were described later for populations included in *andersonii* and *ormistoni*, respectively, earlier; *jordani* was considered a separate species, Jordan's Grass Yellow, in Talbot [19]. It is listed as "Not Rare" by Paul Van Gasse [4] ranging from Garhwal (Mussoorie, one old record), Sikkim to Arunachal (Mishmi Hills), northeast India (Shillong and Garo Hills in Meghalaya, Kaziranga region in Assam), northeast Bangladesh, and northern Burma (Bhamo). According to Varshney and Smetacek [20], the subspecies *jordani* Corbet & Pendlebury is found from Uttarakhand to northeast India; Tripura & West Bengal. This species was first recorded by

Mackinnon & de Nicéville [15] in 1899 from Mussoorie of Garhwal region of Uttarakhand. In 2003, Singh & Bhandari [17], rediscovered this species from the Dehradun Valley in March. Recently it was also recorded by Singh & Sondhi [16] from the New Forest Campus in July 2015.

A single individual of One-spot Grass Yellow *Eurema andersonii* was photographed during a survey near Dabka river of the Pawalgarh Conservation Reserve, Ramnagar (29°22'9.10" N and 79°14'31.82" E). This sighting was made at 12:10 hrs (IST) on 24th April, 2015. A total of 20 individuals were also recorded from the same study area during the survey.

3.2 Common Shot Silverline *Spindasis ictis* (Hewitson, 1865)

Common Shot Silverline *Spindasis ictis* is a member of the family Lycaenidae. It has only a single subspecies in India, i.e. *Spindasis ictis ictis* Hewitson, 1865. According to Gasse [4], it is distributed from south India to Gujarat, Rajasthan, Delhi region, Simla, Garhwal, Uttar Pradesh, Bihar, and lower West Bengal. According to Varshney and Smetacek [20], the species is found from Rajasthan northwards to Himachal Pradesh, eastwards to West Bengal and southwards to Kerala. A single individual of Common Shot Silverline *Spindasis ictis*, was photographed near the Dabka river on 17th March, 2019 at 14:30 hrs (IST), 498 mtr above sea level (asl) in Pawalgarh Conservation Reserve (29°22'17.26" N and 79°14'35.73" E). It was mud-puddling on a damp patch of soil.



Fig 2, 3: One-spot Grass Yellow *Eurema andersonii* (Left) & Common Shot Silverline *Spindasis ictis* (Right) photographed at Pawalgarh Conservation Reserve, Nainital, Uttarakhand.

4. Conclusion

The tarai region of Uttarakhand state is potentially good habitat for butterflies, but it 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. Limited number of butterfly researchers, lack of proper attention/awareness is the main reasons behind the uncertainty relating to the status of butterflies in this state particularly in the tarai region. The records of such species from the area show the importance of conserving lower altitude forest of Uttarakhand. These forests are facing problems of forest fire, boulder mining, poaching, illegal logging and 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. In short, these records are significantly important in updating the status and distribution of these species in Uttarakhand.

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