

Recent record of the Pale Jezebel *Delias sanaca sanaca* (Moore, 1857) (Lepidoptera: Pieridae) from Nainital, western Himalaya, India

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Abstract

A sub-species of Pale jezebel, *Delias sanaca sanaca* was recently recorded in the Oak forests of nainital, western Himalaya and found feeding on *Berberis chitria* (shrub). There is no site-specific record of *D.s. sanaca* from Kumaon region which makes this reporting the first site specific record from Nainital, Kumaon region. We recorded and photographed the sub species on total four different localities in and around Nainital. The present findings of *D.s. sanaca* in Nainital underscore the need for further studies on the ecology, habitat and distribution of the species as the species is very less studied.

Keywords: *Delias sanaca*, *Berberis chitria*, *Dendrophthoe* species, Schedule I, Kumaon

Introduction

The species Pale Jezebel, *Delias sanaca* (Moore, 1857), belongs to the family Pieridae Known to occur throughout the Himalaya upto Myanmar in the east. It occurs as four sub-species in the Indian subcontinent. *Delias sanaca sanaca* (Moore, 1857) which occurs from Kashmir (Banihal Pass) and Kangra (Himachal Pradesh) to Kumaon (Uttarakhand). *Delias sanaca oreas* (Talbot, 1928) occurs from Western Nepal to Sikkim. *Delias sanaca perspicua* (Fruhstorfer, 1910) distributed across Northeastern Burma (Myanmar) and *Delias sanaca bhutya* (Talbot, 1937) known to occur across Bhutan and Arunachal Pradesh (Gasse, 2013) [3].

The sub species *D.s. sanaca* regarded as 'rare' by Talbot 1947 [17] and is currently protected under Schedule I (Part IV) of the Indian Wildlife (Protection) Act, 1972. It has been recorded historically in Himachal Pradesh and Mussoorie earlier (Moore, 1882; Mackinnon & de Nicéville, 1899; Moore, 1903–1905; Ollenbach, 1930; De Rhen-Philipe, 1931; Talbot, 1947) [6, 7, 8, 11, 13, 17]. However, after a long gap of about 80 years, it has recently been reported from Mussoorie hills of Garhwal region (Singh, 2016) [15]. There is no site-specific record of *D.s. sanaca* from Kumaon region. Therefore, our reporting is the first site specific record from Nainital, Kumaon region.

Material and methods

After the first sighting of *D.s. sanaca* near Naini lake, the survey was done during the month of May and June of 2020 in forest trails, open fields, near water bodies and near residential areas randomly. We recorded and photographed *D.s. sanaca* (Image 2) on total four different localities in and around Nainital (Image 1). Details of sightings are given below.

1. On 26th May 2020, around 10 am, more than 20 males were recorded in Thandi sadak (Image 2a.) near Naini lake (altitude 1940m). Some individuals recorded in flight and some of them were mud puddling. The site has vegetation of *Quercus leucotrichophora*, *Platanus orientalis*, *salix alba*, *Debregeasea longifolia* etc.
2. On 9th June 2020, around 2 pm, few males were recorded in Tiffin top (Image 2b.) at the altitude of 2200m. They were mud puddling. This site is about 4 Km further in the south west direction from the first site. The site has vegetation of *Quercus floribunda*, *Cedrus deodara*, *Quercus leucotrichophora* etc.
3. Again, on 9th June 2020 around 3 pm, about a kilometer south from the point of second record, 40+ males were recorded in Nainital Cliffs at the altitude of 2270m. They were recorded feeding on *Berberis chitria* (Image 2c.). The habitat was a mixed forest of *Quercus floribunda*, *Quercus leucotrichophora*, *Cedrus deodara* etc.
4. On 29th June, around 4 pm, a dead male (Appendix I: Image 7 and Image 8) was recorded near Meivilla compound (Image 2d.) at the altitude of 2050m. The site has quite rich vegetation of *Quercus leucotrichophora* and *Cedrus deodara*.

Identifications has been done with the references of Talbot (1939, 1947) [16, 17], Gupta & Mondal (2015) [4], Wynter-Blyth (1957) [20], and web resource (<http://www.ifoundbutterflies.org/>). Males of this sub species has well developed white markings on the upper side and submarginal spots on the forewings are large and triangular. While in females, upper side ground colour is paler brown. Also confirmed by Peter Smetacek (Butterfly Research Centre, Bhimtal, Uttarakhand, India).

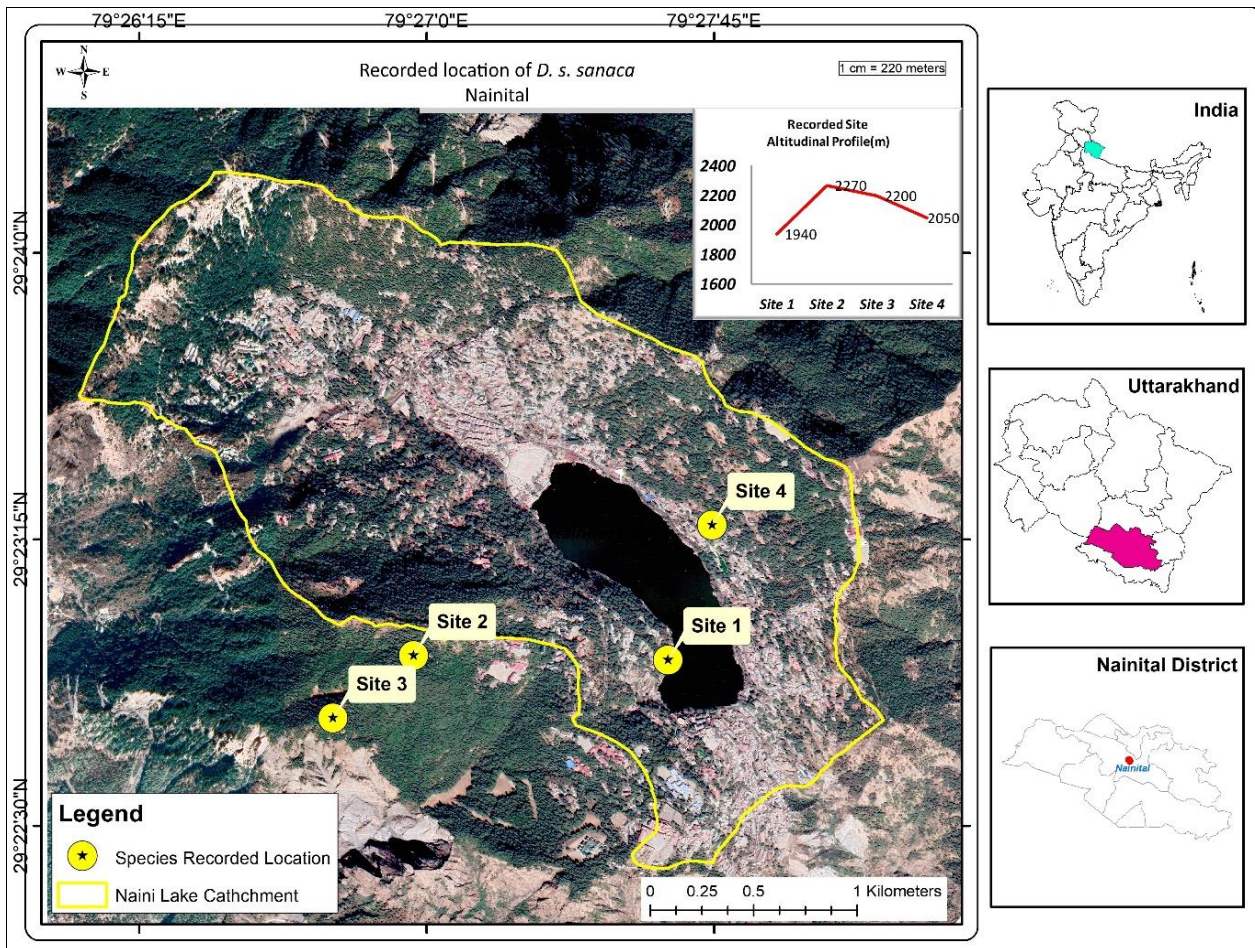


Fig 1: Location Map of the study area



Image 1: (a) Upper side of *Delias sanaca sanaca*, male (b) Lower side of *Delias sanaca sanaca*, male.

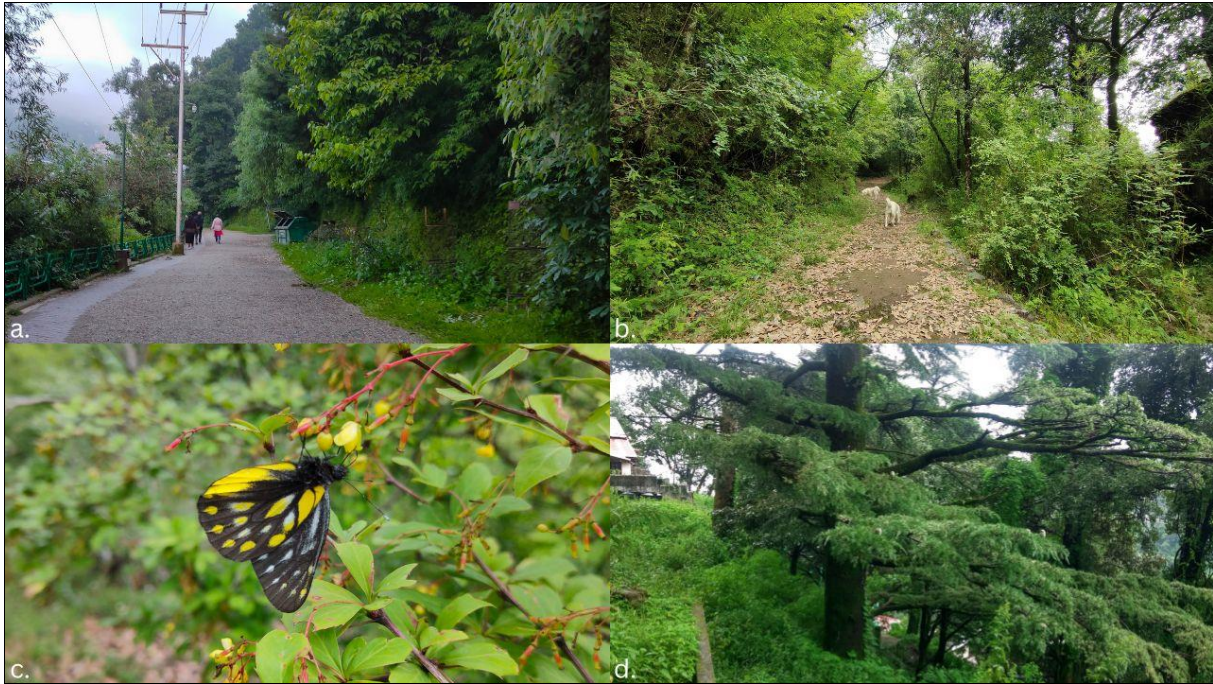


Image 2: (a) Vegetation of *Debregeasea longifolia*, Oak etc, Thandi sadak (site 1), (b) Mixed Oak Forest, near Tiffin top (site 2), (c) *Delias sanaca sanaca*, male, (site 3) feeding on *Berberis chirtia*, Cliffs, (d) Mixed vegetation of *Cedrus deodara* and *Quercus leucotrichophora*, Meivilla compound, Nainital (site 4).

Result and discussion

The present study substantiates the presence of the subspecies in the Nainital, Kumaon region. We observed the presence of more than 70 individuals of *D. s. sanaca* in Nainital, Uttarakhand before the onset of the monsoon season. The altitudes of the observed sites varied within the range of 1940 to 2270 meters above sea level. Oak trees were consistently observed at all the sites. Additionally, it was observed that *D. s. sanaca* depends on *Berberis chirtia* as one of the sources of nectar, which is an important shrub known for its diverse medicinal use (Pandey *et al.* 2013) ^[12]. The known larval food plants of *D. sanaca* are *Dendrophthoe* species. and other mistletoes of the family Loranthaceae (Kehimkar 2008) ^[5].

The findings suggest that the further research needs to be done as more information is required on habitat and ecology of the species and more data should be collected to assess its distributional range and conservation status as the species is very less studied.

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Conflict of interest

All authors declare no conflict of interest.

Author contributions

SR, MR and SS conceived the study. SR and SS carried out the fieldwork. SR wrote the first draft of the paper. All the authors revised the initial draft and approved the final draft for submission.

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