



Taxonomic Studies of Species *Euchloe daphalis* (Moore) (Pieridae: Anthocharini) from North-West of Himalaya

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

In India, tribe Anthocharini is represented by two genera i.e. *Euchloe* and *Hebomoia*. The genus *Euchloe* Hubner is represented by single species *Euchloe daphalis* (Moore) in India. This species is distributed in high altitude areas of North-West Himalaya and is very rare. During present studies, the taxonomy of the species is discussed, and the female genitalia is described and illustrated for the first time.

Keywords: *Anthocharini; Female genitalia; Himalaya; Pieridae; Status.*

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1. INTRODUCTION

The genus *Euchloe* was established by Hubner (1819) on the basis of its type species *Euchloe ausonia* Kirby. The genus is *Palearctic* and *Nearctic* in distribution and there are total 25 species found in the globe and belong to tribe Anthocharini under the subfamily Pierinae of family Pieridae [1]. Out of these, only one species i.e. *Euchloe daphalis* (Moore) is found in India and distributed between the altitude of 2400 to 3500 m. It is high altitude butterfly with distribution limited to Pir Panjal and trans Himalayan ranges. It flies in months of May to August. The genus *Euchloe* Hubner has been studied by Antram [2], Evans [3], Talbot [4], Wynter-Blyth [5], D'Abrera [6], Shou [7], and Korb and Bolshakov (2011). Talbot (loc. cit) described that the wing patterns of *Euchloe* resemble with the representatives of *Pontia* Fabricius. In the present work, the wing patterns of both the sexes of *Euchloe daphalis* (Moore) have been compared with the members of *Pontia* Fabricius and found that they resemble with the wing patterns of the male of *Pontia daplidice* (Linnaeus) with slight differences. In present work it has been observed that in species *Euchloe daphalis* (Moore), the apical border is narrow, small and concave discocellular bar whereas in *Pontia daplidice* (Linnaeus), the apical border is broad and the discocellular spot is divided into two black stripes by thin white line. The ventral surface of hindwing in both the species possess web-like network of greenish-white markings.

2. MATERIALS AND METHODS

During this research work, various localities of India have been survey in view of collection of family Pieridae, but no adult could be collected of species *Euchloe daphalis* (Moore). The specimens were examined from the collections housed at ZSI Kolkata and ZSI, Solan. The representatives were identified on the basis of their morphological characters by consulting literature such as Antram [2], Bingham [8], Evans [3], Talbot [4] and Wynter-Blyth [5]. The images of dorsal and ventral sides of the specimens were obtained with a digital camera (Nikon D7000 18-105 mm). The genitalia dissections have been done by adopting the method proposed by Robinson [9]. The photography of the male external genitalia has been accomplished by using Leica binocular microscope equipped with a photographic unit.

3. RESULTS AND DISCUSSION

Order Lepidoptera Linnaeus, 1758
Superfamily Papilionoidea Latreille, 1802
Family Pieridae Swainson, 1820
Subfamily Pierinae Duponchel, 1835
Tribe Anthocharini Tutt, 1896

Genus *Euchloe* Hubner, 1819

Common name: Little Whites

Euchloe Hubner, 1819; Verz. bek. Schmett. (6): 94.
Phyllocharis Schatz, 1886; Exot. Schmett. 2 (2): 71.
Elphinstonia Klots, 1930; Bull. Brooklyn ent. Soc. 25 (2): 87.
Euchloe Winhard, 2000; Butterflies of the World 10: 6.
Euchloe Korb & Bolshakov, 2011; Eversmannia Suppl. 2: 25.

Type species: *Euchloe ausonia* Kirby, 1871

Euchloe ausonia Kirby, 1871; Syn. Cat. Diurn. Lep.: 506.

Diagnosis: Forewing dorsal surface yellow color absent; apex black; a black discocellular spot present. Hindwing ventral surface with greenish-brown web-like network, enclosing white spots.

Distribution: Afghanistan, Algeria, Altai, Arabia, Asia Minor, Baluchistan, British Columbia, California, Canary Islands, Egypt, Ethiopia, France, India, Iran, Israel, Italy, Kazakhstan, Macedonia, Mexico, North Africa, Pamirs, Spain, Switzerland, Syria, Turkey, Uzbekistan, Vancouver.

Euchloe daphalis (Moore, 1865).

Common name: Pearl White (Plate 1).

Anthocharis daphlis Moore, 1865; Proc. zool. Soc. Lond. (2): 491.

Euchloe daphlis Korb, & Bolshakov, 2011; Eversmannia Suppl. 2: 25.

Adult (Male): Forewing dorsal surface white; costa with blackish minute dots; black irregular narrow apical bar and subapical bar from costa upto vein M₃; strongly arched discocellular blackish spot. Ventral surface creamish-white; costa with blackish minute dots; strongly arched discocellular blackish spot; apex with black web-like network. Hindwing dorsal surface whitish, without maculation but ventral side maculation

visible through. Ventral surface whitish with greenish-yellow web-like network.

Adult (Female): Markings are similar to as in male but slightly broad in female. Forewing dorsal surface white; costa with blackish minute dots; apex blackish with white four spots in the subapical bar; little concave discocellular

blackish spot. Ventral surface creamish-white; costa with blackish minute dots; little concave discocellular blackish spot; apex brownish-green with silvery-white spots in subapical bar. Hindwing dorsal surface whitish, without maculation but ventral side maculation visible through. Ventral surface whitish with yellowish-green transversely placed bars.

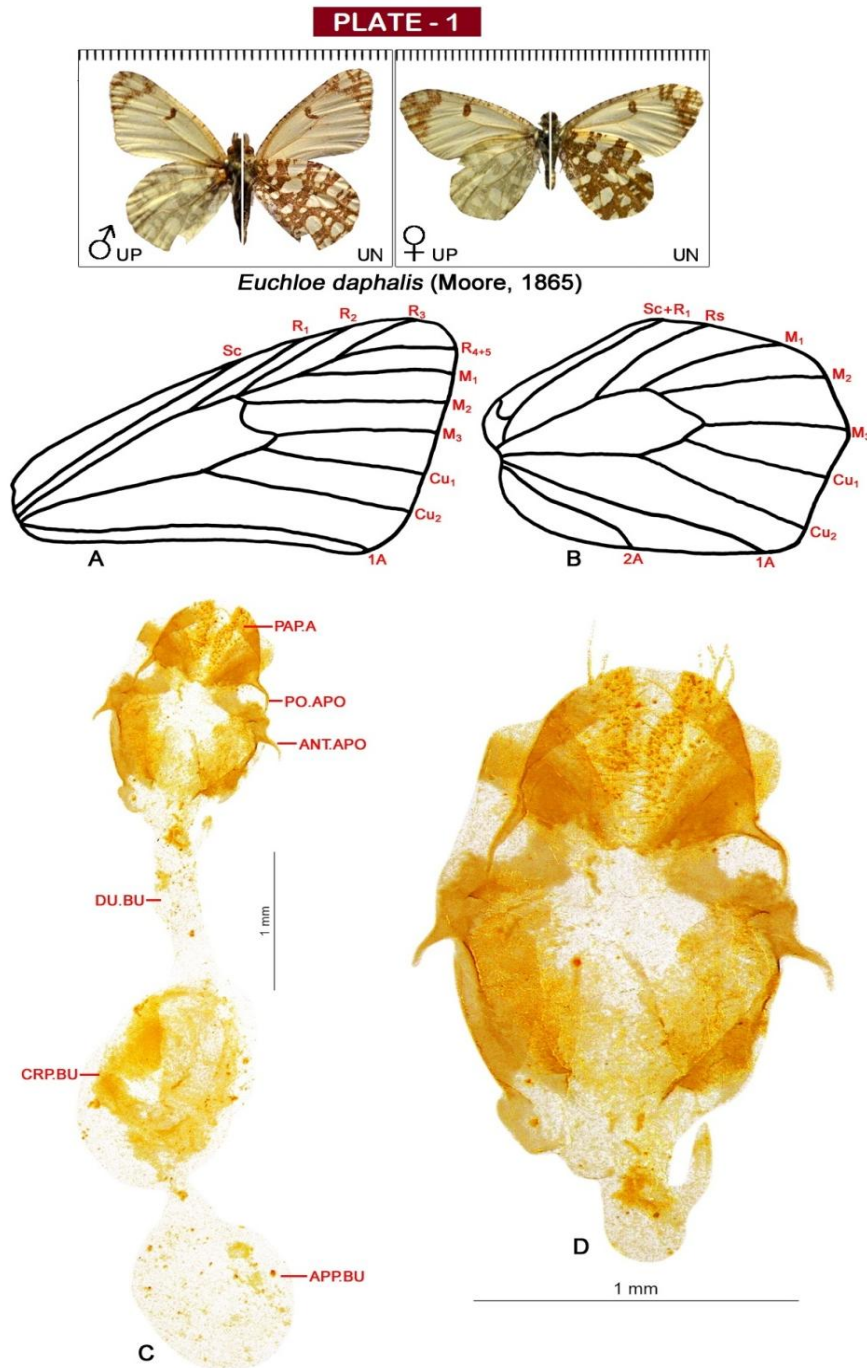


Plate 1. Morphology of pearl white

Wing Expanse: 35-40 mm.

Male Genitalia: Not studied.

Female Genitalia: Corpus bursae oval-shaped, appendix bursae spherical, as long as corpus bursae; ductus bursae long and broad; papilla analis somewhat rounded, pilosed, heavily sclerotized; posterior apophysis and anterior apophysis same in length, sclerotized, narrow, curved downwardly, genital plate bilobed.

Material Examined: 2♀, Goorais valley, J&K, 28.v.1887; 1♀, Ladakh; 1♀, Himachal Pradesh.

Purthi, 1 exs, 18.V.2008, coll. A. K. Sidhu and party.

Distribution in India: Goorais valley, Himachal Pradesh, Ladakh, Uttarakhand.

Global Distribution: Afghanistan, Pakistan, Pamir.

Remarks: *Euchloe daphalis* (Moore) is a rare species in the above said areas. Bingham [8] described this species as a race of *Synchlora belia* (Linnaeus) and mentioned its distribution from Western Himalaya, Kunawur, Goorais valley and Punjab. Evans [3] and Talbot [4] reported it as a subspecies of *Euchloe ausonia* (Hubner) with no distribution from India. Sidhu [10] reported this species from Pangri valley with its diagnostic characters. Varshney and Smetacek [11] reported it as *Euchloe daphalis* (Moore) from Uttarakhand. In this work, the female specimens with its genitalic attributes from Ladakh (now declared as Union territory) have been studied and illustrated for the first time. The appendix bursae is extremely large in *E. daphalis* (Moore) as compared to other species of family Pieridae.

4. CONCLUSIONS

The species *Euchloe daphalis* (Moore) has been recorded rare from dry tract of North-West Himalaya [12]. Varshney and Smetacek [11] mentioned it from Uttarakhand in their work of Catalogue of India Butterflies. In ZSI collections, the species has been collected in 18th century from J&K, Ladakh and Himachal. However Sidhu [10] collected it from Purthi in Pangri area of Himachal Pradesh. The distribution of species is restricted to High altitude areas of North-West Himalaya of India and need immediate attention

of its conservation. The species is treated taxonomically and redescribed in present studies by including the female genitalic organs.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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