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Genus *Biston* leach (Lepidoptera, Geometridae, Ennominae) from Kashmir valley

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Abstract

Two species of lepidopteran family geometridae, subfamily ennominae, *Biston betularia* (Linnaeus, 1758) and *Biston suppressaria* (Guenee, 1858) are analysed for morphology.

Keywords: *Biston*, Kashmir valley, ennominae, morphology, genitalia

Introduction

Genus *Biston* Leach^[7], was established with three species, *Geometra prodromaria*^[2], *Phalaena (Geometra) betularia*^[8] and *Phalaena hirtaria*^[1]. *Geometra prodromaria* was designated as the type species of *Biston*^[11] and was later found to be a junior synonym of *Phalaena strataria*^[5] by^[9]. *Phalaena betularia* is still treated as a member of *Biston*. Hampson (1895) gave a wider concept of *Biston* and synonymised *Eubyjodonta* Warren, *Amraica* Moore, *Buzura* Walker and *Cusiala* Moore under it. Broader concept of *Biston* was established by examining external and genital characters of the Palaearctic and the East Asiatic species^[6]. Broad concept of the tribe Boarmiini was proposed which also subsumed the previously separate tribe Bistonini, and provided the diagnostic characters for the genus *Biston*^[4]. *Biston* Leach was catalogued from the Globe and synonymised 11 genera i.e. *Amphidasea* Unger, *Amphidasis* Treitschke, *Amphidasys* Sadoffsky, *Blepharoctena* Warren, *Buzura* Walker, *Culcula* Moore, *Dasyphara* Billberg, *Epamraica* Matsumura, *Eubyja* Hübner, *Eubyjodonta* Warren and *Pachys* Hubner under it^[10]. A total number of 11 species have been included in *Biston* Leach from India^[10]. The present species *Biston betularia* (Linnaeus) and *Biston suppressaria* (Guenee) were collected during summer 2017 from different locations of Kashmir valley.

Materials and Methods

The portable bucket type light traps fitted with 125 W mercury vapour lamp were used for collection. To avoid the wings from being damaged due to overcrowding in the bucket type light trap, the mercury vapour lamp were hung along a white cloth sheet secured to a wall or directly over a plain white wall. Moths sitting on the cloth or wall were quickly trapped with the help of wide mouth glass tube and shall be transferred to killing jar. The collected moths were killed with ethyl acetate vapours, processed and preserved.

Results and Discussion

Biston Leach

Leach 1815: 9: 134

Type species: *Geometra prodromaria* Denis.

Distribution: Holarctic, Oriental, and Ethiopian regions.

Diagnoses: Labial palpus small, with hair scales, not extending beyond frons; Antennae in male is bipectinate, length tapering towards apex, often the distal part of antennae without rami; filiform antennae in female; Slightly dilated hind tibia with two pairs of spurs in both sexes. Frenulum well developed; Forewing without basal fovea in male, triangular, outer margin straight or wavy, hindwing round, outer margin smooth, sometimes concave between M1 and M3 or protruding between M1 and CuA1; Male genitalia with short and broad uncus often bifurcate terminally, Valva simple, Saccus round or semicircular, Aedeagus often

cylindrical, sclerotized dorsally, scobinate, with or without cornuti of various shapes; Female genitalia with long, membranous, sometimes medially curved corpus bursa, swollen anteriorly, often bearing a signum elliptic, bar-like or irregularly shaped.

***Biston betularia* (Linnaeus, 1758) (Fig.1)**

Linnaeus, 1758. Syst. Nat., (Ed. 10) Vol. 1, Stockholm, Sweden, 824 pp.

Diagnoses

Wing colour is greyish black; hindwing basal line is absent, in forewing R1 and R2 are stalked; antennae are partially bipectinate and filiform at apex in males; forewing postmedial line protrudes outwards between M1 and M3 and between CuA2 and 1A + 2A, discal spots of both wings are stripe-like; in male genitalia, the apex of the uncus and the median process of the gnathos are slender, valva slender and longer, juxta narrow; cornuti is either large bundle of spines or small tuft of spines; female genitalia, ductus bursae is shorter, antrum absent, corpus bursae enlarged, wrinkled and weakly sclerotized posteriorly, narrow medially and swollen anteriorly, signum bar-like.

Wing expanse: Male – 44mm; Female- 51mm.

Material examined: Anantnag, 17.v.17- 3♂♂, 2♀♀; Budgam, 28.iv.17- 1♂, Srinagar, 19.ix.17- 2♂♂, Baramulla, 30.x.17- 1♂,1♀.

Distribution: China, Russia, Mongolia, Japan, North Korea, South Korea, Nepal, Europe, North America.



Biston betularia (Linnaeus)

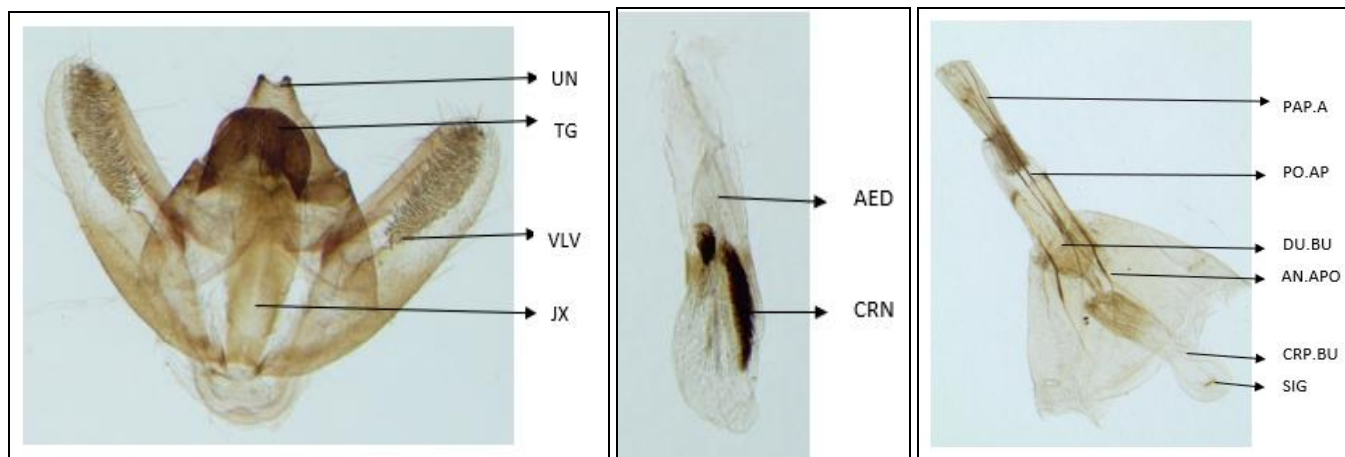


Fig 1: *Biston betularia* (Linnaeus) A. Male genitalia, B. Aedeagus C. female genitalia.

***Biston suppressaria* (Guenee, 1858) (Fig.2)**

Guenee, A. 1858. Uranides et Phalenites In: Boisduval JBAD, Guenee A (Eds) Histoire naturelle des Insectes (Species general des Lepidopteres) 9: i–lvi, 1–514; 10: 1–584; Atlas; pls. 1–22.

Diagnoses

Male antennae bipectinate in basal two-thirds, filiform in terminal one-third; Frons not protruding, smooth scaled, Labial palpus black, small, not extending beyond frons; Hind tibia with two pairs of spurs in male, slightly dilated, without hair-pencil; Wings greyish white, dotted with pale grey scales, Forewing outer margin straight, hindwing round, protrusion between M1 and M3 of the forewing postmedial line is shorter, shallowly bilobed and sometimes round; the projection between M1 and M3 of the hindwing postmedial line is round; Male genitalia, Uncus short, broad at base, narrow towards tip, well sclerotized; tegumen longer than uncus, v-shaped, weakly sclerotized; vinculum longer than tegumen, u-shaped; saccus weakly developed; juxta well developed, oval; valva narrow at base, well sclerotized, upper part well differentiated into cucullus and valvula, heavily

setosed with setae; aedeagus long and broad, well sclerotized.

Wing expanse: Male-35 mm.

Material examined

Anantnag, 22.v.17- 2♂♂; Budgam, 12.x.17- 1♂, Baramulla, 10.xi.17- 2♂♂.

Distribution: Japan; Kangra; Sikkim; Assam; Calcutta; Ceylon.

Abbreviations

AED: Aedeagus; ANT.APO: Anterior apophyses; CRP. BU: Corpus bursae; CRN: Cornutus; CUA1: First cubital vein DU. BU: Ductus bursae; JX: Juxta; M1: First median vein; M3: Third median vein; PAP.A: Papilla analis; PO.APO: Posterior apophyses; R1: First radial vein; R2: Second radial vein; TG: Tegumen; SIG: Signum; UN: Uncus; VLV: Vulva.

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Biston suppressaria (Guenée)

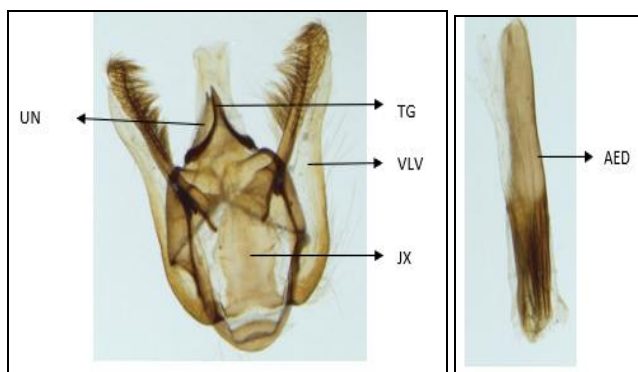


Fig 2: *Biston suppressaria* (Guenée) A. Male genitalia, B. Aedeagus

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