GENITALIAL MORPHOLOGY OF SOME EUPTEROTIDAE (LEPIDOPTERA) FROM SHIVALIKS IN INDIA

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Abstract

External genitalial morphology of five species of Eupterotidae namely, Apona cashmirensis *Kollar,* Eupterote undata *Blanchard,* Eupterote assimilis *Moore,* Eupterote fraterna *Moore, and* Eupterote decorata *Moore were studied and a key for their identification is presented in this paper.*

Keywords

Eupterotidae, genitalia, India, key, Lepidoptera.

Holloway (1987) mentions Eupteroidea as a small but most diverse tropical group of moths in Africa and the Oriental region. Moths belonging to this superfamily are characterized by the forewings possessing a series of indistinct waved lines (fasciations), out of which the double postmedial may be consistent. The hindwings too have such patterns which may be somewhat reduced and simple. All the fasciations may be clear or none may be clear, even in the specimens collected from the same locality (Hampson, 1892). During the course of the present study, a phenon comprising of 14 individuals were examined which belonged to the genus *Eupterote* Hübner, particularly because of typical wing pattern of multiple crenulate fasciations and a strong double postmedial line. The male genitalia of the type species, *fabia* Cramer has been given by Holloway (1987) and various constituent parts of the presently studied species, *viz*., *Eupterote decorata* Moore, *E. undata* Blanchard, *E. fraterna* Moore and *E. assimalis* Moore do possess bifid uncus diagnostically fused to the tegumen, gnathos absent, valva fused together basally to about one-third of their length, inner margin of the valvae being setose and corrugate, distal possession of each valva somewhat blunt and apex terminates into a slightly coiled narrow process. The vesica is tube-like. The genitalia of all the species, mentioned above, not only agree with the type species but are also congeneric to each other. However, these species can be very well differentiated on the basis of structure of the juxta and saccus. The present research deals with the five species *i.e*., *Apona cashmirensis* Kollar, *Eupterote undata* Blanchard, *E, assimilis* Moore, *E, fraterna* Moore, and *E, decorata* Moore while taking surveys-cum-collection tour to various localities in the Punjab Siwaliks. Besides giving an illustrated account of the genitalia, keys to their genera and species has also been furnished.

Description of external genitalia of species studied

***Apona* Walker**

Apona Walker, 1856, *List Specimens Lepid. Insects Colln. Br. Mus.,* 7 : 1762.

Type species: *Apona pallida* Walker, 1856, *ibidem,* 7 : 1763, by monotypy.

***Apona cashmirensis* Kollar**

Apona cashmirensis Kollar, 1848, *In Hügel Kashmir*, 4 : 472, pl. 21, fig. 4.

Material examined

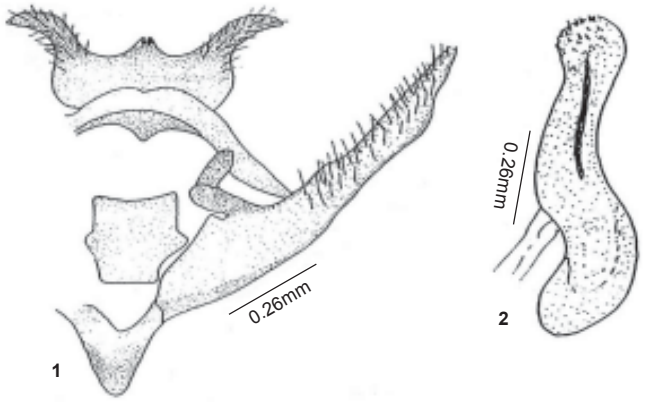
Two males, 25.vii.2000, Nangal, Roopnagar District, Punjab, 370m, coll. Rachita Sood & P.C. Pathania

Distribution

North-West Himalayas and Sikkim (Hampson, 1892).

Male genitalia (Figs. 1 & 2)

Uncus bifid, produced into lobes that are weakly setosed; gnathos tounge like; tegumen broad, simple, weakly sclerotised; vinculum U-shaped; saccus V-shaped, broad; valva well developed, elongated, narrow, costal margin arched slightly near base, gradually straightened towards apex, apex pointed, sacculus elongated, margin smooth, nearly straight; juxta squarish plate; aedeagus slender, strongly curved posteriorly, vesica tubular, armed with cornuti, cornuti small denticles like.



Figures 1-2.* Apona cashmirenses *Kollar
1 - Male genitalia: ventral view; 2 - Aedeagus

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Female genitalia: Not examined.

Alar expanse: Male 114mm.

Remarks
Walker (1856) proposed the genus *Apona* with *pallida* from the Himalayan mountains as its type species. According to Fletcher and Nye (1982), this is a junior subjective synonym of *Gastropacha cashmirensis* Kollar. The genus *Apona* has been considered in Drepanulidae, Lasiocampidae (Moore, 1872) and Eupteroidea (Hampson, 1892) by the respective workers. The latter nomenclature is presently followed owing to its overall acceptance (Scoble, 1995). The species seems to be quite rare as per present collection records.

Eupterote Hübner

Eupterote Hübner (1820) 1816, *Verz. bekannter Schmett.*: 187.

Type species: *Phalaena fabia* Cramer, 1779, *Uitlandsche kapellen (Papillions exot.),* 3 : 98, pl. 250, fig. B, by subsequent designation by Moore [1883], 1882-3, *Lepid. Ceylon,* 2 : 141.

Eupterote undata Blanchard

Eupterote undata Blanchard, 1882. *Jacq. Voy. Inde, Zool. Ins.,* 23, pl. 1, fig. 8.

Material examined
Two males, 26.vi.2001, Dunera, Gurdaspur District, Punjab, 700m; one female, 5.vii.1999, PUP, Patiala District, Punjab, 250m, coll. Rachita Sood & P.C. Pathania.

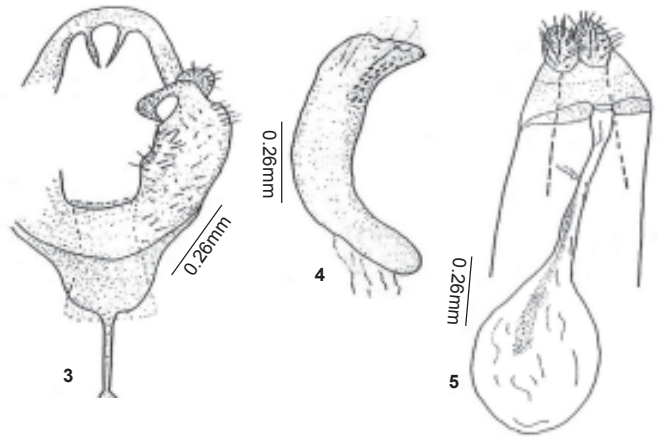
Distribution
Jabbalpore and Sikkim (Hampson, 1892).

Male genitalia (Figs. 3 & 4)
Uncus bifid, diagnostically fused to the tegumen, both appear continuous; gnathos absent; tegumen broader fused to uncus, sclerotised; vinculum U-shaped; saccus thin, long, rod-like, slightly expanded basally; valvae fused together basally over one-third of length, inner margin setosed, corrugate, slightly blunt distally, coiled, narrower at apex, heavily sclerotised; juxta much elongated, reaching beyond vinculum; aedeagus highly ankylosed or fused to juxta; vesica tube like, slightly swollen, finely scobinated apically.

Female genitalia (Fig. 5)
Ovipositor lobes elongated, narrow, setosed; posterior apophyses shorter than the anterior apophyses; both apophyses strong, sclerotised, rod-like; ostium bursae ring-like, narrow, with sclerotised lobes on the lateral sides; ductus bursae elongated, narrow, wider towards corpus, slightly sclerotised; ductus seminalis originating just subbasally on the ductus bursae; corpus bursae globular, without signum.

Alar expanse: Male 94 mm.

Remarks
The species is being reported for the first time from Punjab Shivaliks.



Figures 3-5. **Eupterote undata** ***Blanchard***
3 - Male genitalia: ventral view; 4 - Aedeagus; 5 - Female genitalia

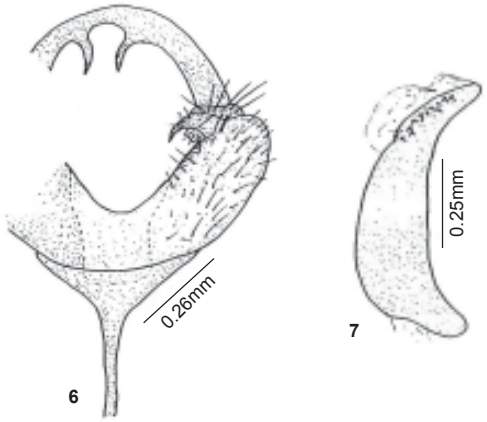
Eupterote assimilis Moore

Eupterote assimilis Moore, 1884. *Trans. Ent. Soc.,* p. 363.

Material examined
Two males, 29.vi.1999; one male, 27.vii.1999, PUP, Patiala District, Punjab, 250m, coll. Rachita Sood & P.C. Pathania.

Distribution
Dharamshala, northern India (Hampson, 1892).

Male genitalia (Figs. 6 & 7)
Uncus bifid, teeth-like projection, heavily sclerotised, fused to tegumen; tegumen ring-like; vinculum U-shaped, given off into much elongated saccus; saccus not expanded (bulbous) basally; valva fused basally over one-third of the length, setosed, narrower apically, heavily sclerotised, blunt distally, distal process slightly curved, broad; juxta elongated not reaching beyond vinculum; aedeagus slightly arcurate, lower tip blunt; vesica tube like, finely scobinated apically.



Figures 6-7. **Eupterote assimilis** ***Moore***
6 - Male genitalia: ventral view; 7 - Aedeagus

Female genitalia: Not examined.

Alar expanse: Male 81mm.

Remarks
The present collection is an additional distribution record for Punjab.

***Eupterote fraterna* Moore**
Eupterote fraterna Moore, 1888, *Proc. Zool. Soc. Lond.,* p. 406.

Material examined
Two males, 3.viii.1999, PUP, Patiala District, Punjab, 250m; one male, 4.viii.1999; two males, 7.viii.2000, Roopnagar, Punjab, 350m, coll. Rachita Sood & P.C. Pathania.

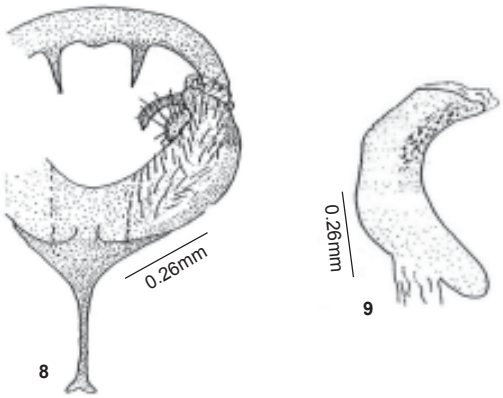
Distribution
Dharamshala (Hampson, 1892).

Male genitalia (Figs. 8 & 9)
Uncus bifid, diagnostically fused to the tegumen, uncus appears to be divided into teeth like projection, teths slender, short; gnathos absent; tegumen ring-like; vinculum broad U-shaped; saccus elongated; valva fused basally are one third of length, inner margin setosed, corrugate, slightly blunt distally, coiled, narrower at apex, apex curved, produced, heavily sclerotised; juxta not much elongated; aedeagus much arcurate apically, short, vesica finely scobinated apically.

Female genitalia: Not examined.

Alar expanse: Male 84mm.

Remarks
The species, under reference, is reported for the first time from Punjab Shivaliks.



Figures 8-9.* Eupterote fraterna *Moore
8 - Male genitalia: ventral view; 9 - Aedeagus

***Eupterote decorata* Moore**
Eupterote decorata Moore, 1884. *Trans. Ent. Soc.,* p. 309.

Material examined
Two males, 4.viii.1999;one male, 18.viii.2003, PUP, Patiala District, Punjab, 250m, coll. Rachita Sood & P.C. Pathania.

Distribution
Punjab (Hampson, 1892).

Male genitalia (Figs. 10 & 11)
Uncus bifid, teeth like projections, fused to tegumen; much elongated and broad; vinculum U-shaped, broader; saccus elongated, rod-like, posterior base slightly swollen; valvae fused basally to one-third of length, inner margin setosed, corrugate, slightly blunt distally, curved apically, apex heavily sclerotised; juxta small cup like; aedeagus not arcurate, nearly straight apically, vesica tube like, finely scobinated apically.

Key for the separation of species studied

The following key has been prepared for the separation of species covered in the present study:

1. Labial palpus long, heavily fringed with hairs; male genitalia with gnathos present; valvae well developed, saccus V-shaped..... ***Apona* Walker**

1A Labial palpus short, not so heavily fringed with hairs; male genitalia with gnathos absent; valvae reduced, saccus thin, much elongated, rod-shaped ..... ***Eupterote* Hübner**

Key to the Indian species of the genus *Eupterote* Hübner

1. Ground colour slightly redder; female with ground colour redder or yellow; male genitlaia with uncus process comparatively more developed; juxta much elongated, reaching beyond vinculum..... ***undata* Blanchard**

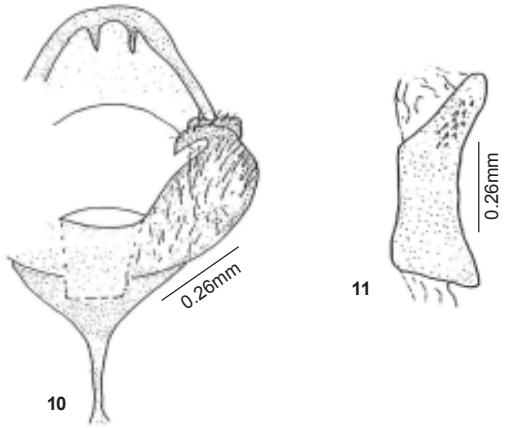
1A Ground colour never redder in tinge; male genitalia with uncus process comparatively less developed; juxta never reaching beyond vinculum **2**

2. Ground colour slightly pale cinnamon brown, collar tinged yellow; male genitalia with saccus not expanded or bulbous basally; valva with distal process slightly curved, broad..... ***assimilis* Moore**

2A Ground colour not cinnamon brown; collar never tinged yellow; male genitalia with saccus expanded basally; valva with distal process much curved, narrow..... **3**.

3 Ground colour vinous-brown, the irregular crenulated waved lines weak or nearly obsolescent; male genitalia with tegumen ring-like; aedeagus much arcurate apically..... ***fraterna* Moore**

3A Ground colour sulphur yellow; irregular crenulated waved lines much conspicuous dark brown in colour; male genitalia with tegumen elongated; aedeagus not arcurate, nearly straight apically..... ***decorata* Moore**



Figures 10-11 **Eupterote decorata *Moore***
10 - Male genitalia: ventral view; 11 - Aedeagus

Female genitalia: Not examined.

Alar expanse: Male 90mm.

Remarks

Hampson (1892) recorded the species from the then Punjab including Himachal Pradesh and Haryana and did not mention any precise locality. Its collection from the aforesaid locality is an actual place of its availability in the present Punjab.

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BOOK NOTICE

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by

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Chapter 4 - Identification
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