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Cover: Pseudo-flying animals and wind-dependent seed & spore dispersers – made with digital painting in Krita. © Melito Prinson Pinto

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COMMUNICATION

Report of a tussock moth genus *Maeoproctis* (Lepidoptera: Erebidae: Lymantriinae: Nygmiini) from India

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Abstract: A new genus of Lymantriinae, *Maeoproctis* gen. nov. has been proposed with *Euproctis latifascia* (Walker) as its type species. The morphological descriptions and diagnosis have also been provided for the new genus. Another species *subfasciata* Walker has been shifted under the new genus as a new combination *Maeoproctis subfasciata* (Walker) comb. nov.

Keywords: *Maeoproctis*, *Euproctis, latifasciata*, *subfasciata*, Lymantriinae, India.

Abbreviations: 1A—First anal vein | 2A—Second anal vein | AED—Aedeagus | ANT.APO—Anterior apophyses | CRN—Cornuti | CRP.BU—Corpus bursae | CU_1—First cubital vein | CU_2—Second cubital vein | DU.BU—Ductus bursae | DU.EJ—Ductus ejaculatorius | JX—Juxta; |M_1—First median vein | M_2—Second median vein | M_3—Third median vein | PAP—Papilla analis | PO.APO—Posterior apophyses | R_1—First radial vein | R_2—Second radial vein | R_3—Third radial vein | R_4—Fourth radial vein | R_5—Fifth radial vein | SA—Saccus | Sc—Subcosta | Sc+R_1—Subcosta+First radial vein | TG—Tegumen | UN—Uncus | VIN—Vinculum | VLV—Valva.

ਸੰਖੇਪ: ਲਾਈਮੈਨਟਰੀਨੀ ਦੇ ਇੱਕ ਨਵੇਂ ਜੀਨਸ, ਮੀਉਪਰੋਕਟਿਸ ਜੀਨਸ ਨੋਵੇ ਨੂੰ ਯੂਰੋਪੀਰੋਕਟਿਸ ਲੈਟੀਫੇਸੀਆ (ਵਾਕਰ) ਬਤੌਰ ਇਸਦੀ ਕਿਸਮ ਸਪੀਸੀਜ ਦੇ ਨਾਲ ਪ੍ਰਸਤਾਵਿਤ ਕੀਤਾ ਗਿਆ। ਨਵੇਂ ਜੀਨਸ ਲਈ ਰੂਪ ਵਿਗਿਆਨਿਕ ਵਰਣਨ ਅਤੇ ਨਿਦਾਨ ਵੀ ਪ੍ਰਦਾਨ ਕੀਤੇ ਗਏ। ਇੱਕ ਹੋਰ ਸਪੀਸੀਜ਼ ਸਬਫੈਸੀਆਟਾ ਵਾਕਰ ਨੂੰ ਇਸ ਨਵੇ ਜੀਨਸ ਦੇ ਤਹਿਤ ਇੱਕ ਨਵੇਂ ਸੁਮੇਲ ਮੀਉਪਰੋਕਟਿਸ ਸਬਫੈਸੀਆਟਾ (ਵਾਕਰ) ਦੇ ਰੂਪ ਵਿੱਚ ਤਬਦੀਲ ਕੀਤਾ ਗਿਆ।

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Author contributions: Study design and article drafting—ASK & GPKB; field work—GPKB.

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INTRODUCTION

The subfamily Lymantriinae is composed of seven well defined and distinct tribes, viz.: *Lymantriini* Hampson, *Orgyiini* Wallengren, *Nygmiini* Holloway, Leucomini Grote and *Arctornithini* Holoway, *Daplasini* Holloway & Wang, and *Locharinini* Holloway & Wang (Wang et al. 2015). The name 'Maeoproctis' has been proposed as a new genus referable to the tribe *Nygmiini* Holloway for the proper placement of two species, namely, *Euproctis latifascia* (Walker) and *Euproctis subfasciata* (Walker). Both the species are paler in general appearance and have very uniform distinct genitalic characters. In the present study, it has been concluded that both these species belong to a distinct genus rather than *Euproctis* Hübner and thus the new genus has been proposed for the proper placement of both species. *Euproctis latifascia* (Walker) has been proposed as its type species. This new genus is well defined on the basis of male genitalic features such as uncus represented by two narrow widely apart processes, short & distally bifid valva, and distinct tegumen. Though the genus *Euproctis* Hübner is closely allied to this new genus in general appearance and wing venation, it is distinct in terms of its male genitalic features such as unified uncus and simple uni-lobed valva. Chao (2003) outlined the genitalic characters of 103 species under the genus *Euproctis* Hübner in *Fauna Sinica*. Out of these, the three species—*hypoenops* Collenette, *schaliphora* Collenette, and *seitzi* Collenette—also completely conform the characterization of the new genus and can be transferred under it.

MATERIAL AND METHODS

The adult moths were collected from different localities of Himachal Pradesh, Jammu & Kashmir, and Uttarakhand using light traps equipped with a 160W mercury bulb and vertical white sheet. The methodology proposed by Zimmerman (1978) was followed for the study of wing venation. The male and female moths were dissected out to examine the external genitalic features (Robinson, 1976) and the terminology for naming various genitalic parts given by Klots (1970). After detailed study, the specimens were preserved in the Lepidoptera Lab, Department of Zoology & Environmental Sciences, Punjabi University Patiala.

RESULTS

The external morphological characters like ornamentation of antennae, legs and abdomen; wing maculation; wing venation and significantly the external genitalic features contributed towards the authentic identification and characterization of examined taxa. The genus *Maeoproctis* gen. nov. has been proposed new to science with *Euproctis latifascia* (Walker) as its type species. A new combination has also been proposed by shifting *Euproctis subfasciata* (Walker) under the new genus as *Maeoproctis subfasciata* (Walker) comb. nov.

***Maeoproctis* gen. nov.**

Type species: *Euproctis latifascia* (Walker, 1855).

Diagnosis: Medium sized moths, usually pale in colouration. Labial palpi large, hairy, obliquely porrect, reaching above the level of frons. Antennae bipectinate in both sexes, pectinations longer in males. Forewing with discal cell more than half the length of wing, closed; 1A and 2A from base of the wing; 3A absent; Cu_1, M_3 and M_2 from near lower angle of cell; M_1 from upper angle of cell; R_5-R_2 stalked from upper angle of cell, R_2 branching off towards apex; no aerole; Sc from base of wing, not reaching apex. Hindwing with discal cell more than half the length of wing, closed; 1A and 2A from base of the wing; 3A absent; Cu_1 and M_3 stalked from lower angle of cell; M_2 from above lower angle of cell; M_1 and Rs stalked from upper angle of cell. Legs dressed with scales; fore-tibia with an epiphysis; mid-tibia with one pair of tibial spurs; hind-tibia with two pairs of tibial spurs. Abdomen furnished with scales; distinct anal tuft in females. Male genitalia with uncus represented by two narrow widely apart processes making U-shaped appearance; tegumen broad, dumbbell-shaped, with knob-like protrusions on lateral sides of uncus; saccus prominent; juxta well developed; valva simple, short, distally bifid; aedeagus short, vesica armed with prominent spur. Female genitalia with corpus bursae long; signum absent; ductus bursae narrow; apophysis with dilated apices; papilla analis triangular, setosed; pseudo-papillae small, setosed.

Etymology: This new genus has been named after Koen V.N. Maes, an eminent Belgian entomologist.

Remarks: Two species were collected from different localities of Himachal Pradesh, Jammu & Kashmir, and Uttarakhand and identified as *latifascia* Walker and *subfasciata* Walker under genus *Euproctis* Hübner. Both the identified species are paler in general appearance and have very uniform distinct genitalic characters. It seemed that both these species belong to a distinct

genus rather than *Euproctis* Hübner and thus, genus *Maeoproctis* has been proposed as a new genus for the proper placement of both these species. *Euproctis latifascia* Walker has been proposed as its type species. This new genus is well defined on the basis of male genitalic features such as uncus represented by two narrow widely apart processes; short and distally bifid valva and distinct tegumen. Though the genus *Euproctis* Hübner is closely allied to this new genus in general appearance and wing venation, but it is distinct in terms of its male genitalic features such as unified uncus and simple, uni-lobed valva. Chao (2003) outlined the genitalic characters of 103 species under genus *Euproctis* Hübner in *Fauna Sinica*. Out of these, the three species, namely, *hypoenops* Collenette, *schaliphora* Collenette, and *seitzi* Collenette, also completely conform to the characterization of the new genus *Maeoproctis* and can be transferred under it.

***Maeoproctis latifascia* (Walker) comb. nov.**
(Image 1–10)

Leucoma latifascia Walker, 1855, *List Spec. Lepid. Insects Colln. Brit. Mus*., 4: 831.

Euproctis latifascia Walker: Hampson, 1892, *Moths India*, **1**: 472; Chao, 2003, *Fauna Sinica*, 30: 368; Smetacek, 2008, *Bionotes*, 10(1): 14; Kaleka, 2012, *Colemania*, 34: 4.

Euproctis antica Walker, 1855, *List Spec. Lepid. Insects Colln. Brit. Mus*., 4: 835; Swinhoe, 1922, *Ann. Mag. Nat. Hist.,* (9)10(58): 482.

Euproctis abdominalis Moore, 1888, *Proc. Zool. Soc. London*, 1888: 398; Swinhoe, 1922, *Ann. Mag. Nat. Hist.,* (9)10(58): 482.

Euproctis susisharyonis Strand, 1914, *Suppl. Entom.*, 3: 40.

Nygmia latifascia Swinhoe, 1922, *Ann. Mag. Nat. Hist*., (9)10(58): 482.

Type locality: Nepal

Diagnosis: Forewing without any medial band; vein M_2 from lower angle of cell. Male genitalia with uncus represented by two narrow widely apart processes making a U-shaped appearance, dorsally setosed, with blunt apices; juxta dome-shaped without any projection.

Description:

Male: Body length**:** 14–19 mm; wing expanse: 28–42 mm.

Female: Body length: 15–21 mm; wing expanse: 48–56 mm.

Head with vertex and frons clothed with creamish-white scales. Labial palpi fringed with creamish scales. Antennae with scape and flagellum covered with white scales. Thorax, collar, and tegula furnished with white scales. Legs dressed with creamish scales. Abdomen studded with black scales; underside with creamish scales; anal segment fringed with yellow scales in males; anal tuft brown. Forewing with ground colour creamish-white in males, pure white in females; without any marking. Hindwing with ground colour creamish-white in males, pure white in females; without any marking. Forewing with Cu_2 from well beyond two-third of cell having a short bar; Cu_1 from before lower angle of cell; M_3 and M_2 from lower angle of cell; M_1 from upper angle of cell; R_5-R_2 well stalked before upper angle of cell; R_1 from three-fourth of cell. Hindwing with Cu_2 from two-third of cell; Cu_1 and M_3 stalked from lower angle of cell; M_2 from above lower angle of cell; M_1 and Rs well stalked from upper angle of cell; Sc+R_1 from base of wing sending a bar to cell beyond its middle.

Male genitalia: Uncus of moderate size, represented by two narrow widely apart processes making a shape of U, dorsally setosed, with blunt apices; tegumen moderately sclerotized, bulbous on both sides having knob-like protrusions on lateral sides of uncus; vinculum quite narrow extending into prominent U-shaped saccus; juxta well-sclerotized, dome-shaped. Valva simple, moderately sclerotized; distally bifid with two processes, one large and broad, other narrow, both processes setosed. Aedeagus short, moderately sclerotized; proximal end rounded; ductus ejaculatorius entering near proximal end; vesica armed with a well sclerotized prominent spur.

Female genitalia: Corpus bursae narrow, long, membranous, without any distinct signum; ductus bursae narrow with wrinkled walls; entering into well-sclerotized tubular antrum; ostium bursae originating near middle of ductus bursae; sterigmatic plate triangular, well-sclerotized; apophysis narrow of moderate length, basal half moderately sclerotized, distal half semi-sclerotized, both pairs with spatulate apices, posterior apophysis shorter than anterior ones; papilla analis triangular, leaf-like, well setosed; pseudo-papillae small, triangular, well setosed with short and long setae.

Material examined: (39 males, 10 females): Himachal Pradesh: Andretta, 806 m, 32.040°N & 76.567°E, 08.x.2013, 18 males, 5 females; Baijnath, 998 m, 32.052°N & 76.648°E, 09.x.2013, 2 males; Basantpur, 2,148 m, 31.208°N & 77.174°E, 09.vii.2013, 4 males, Chamunda Devi, 996 m, 32.051°N & 76.643°E, 07.ix.2013, 13 males, 2 females; Naina Tikkar, 1,552 m, 30.804°N & 77.119°E, 05.vii.2014, 1 male; Jammu & Kashmir: Lamberi, 336 m,

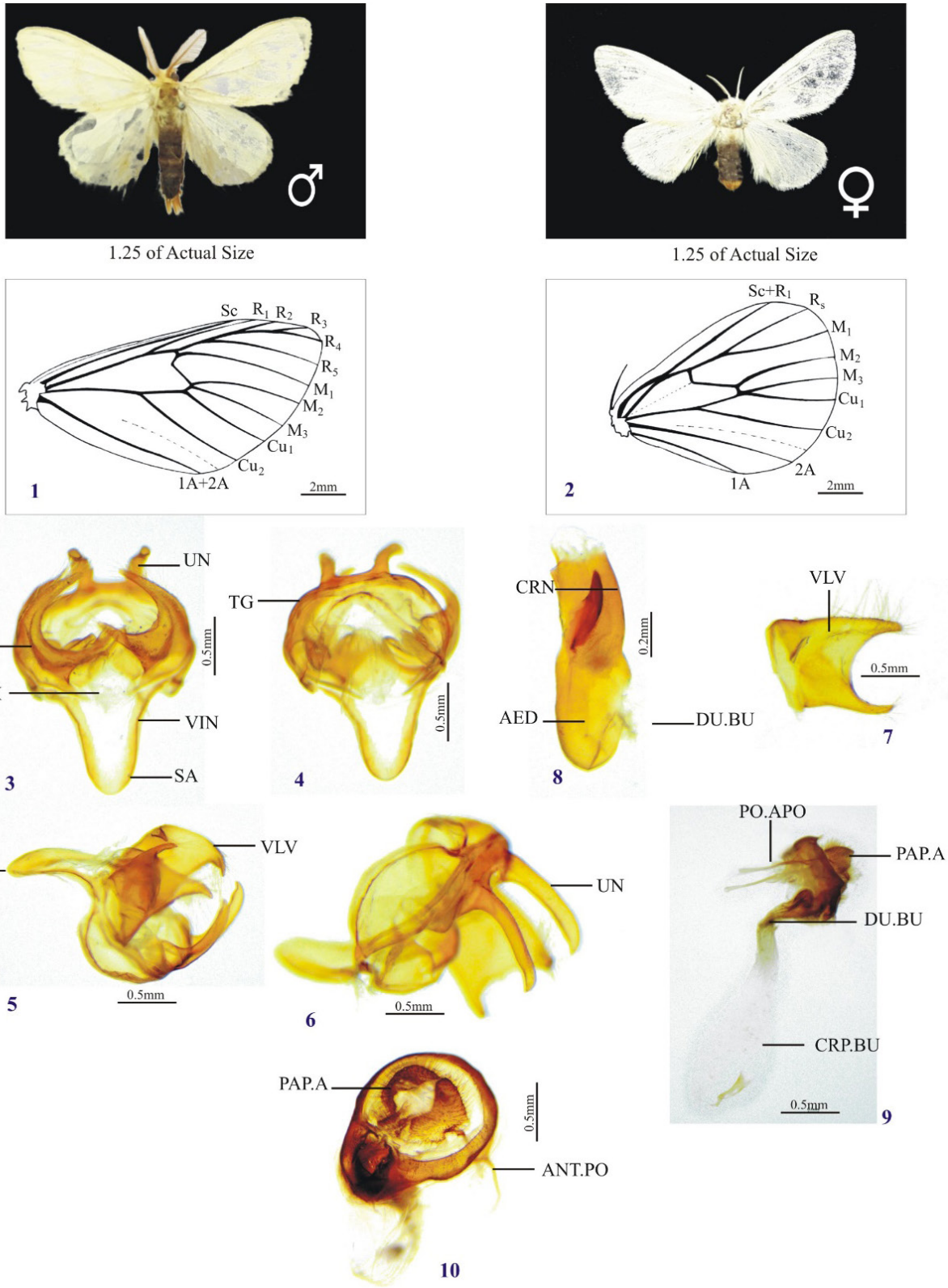


Image 1–10. *Maeoproctis latifascia* (Walker) comb. nov.: 1—Forewing | 2—Hindwing | 3—Male genitalia | 4—Ventral view | 5–6—Lateral view | 7—Valva | 8—Aedeagus | 9–10—Female genitalia.

33.130°N & 74.260°E, 11.ix.2013, 1 male; Uttarakhand: Dhobighat, 1,895 m, 29.886°N &79.045°E, 25.v.2014, 1 female; Makhti poukhri, 648 m, 30.628°N & 77.925°E, 19.v.2014, 2 females. Coll. Gagan Bali.

Distribution: India: Himachal Pradesh, Jammu & Kashmir, Manipur, Uttarakhand; China; Nepal (Walker 1855; Hampson 1892; Chao 2003; Smetacek 2008; Kaleka 2012).

Remarks: Walker (1855) described this species under genus *Leucoma* Stephens from Nepal. Hampson (1892) transferred it to the genus *Euproctis* Hübner. Chao (2003), Smetacek (2008), and Kaleka (2012) followed the same nomenclature. In the present studies, the species under reference has been proposed as the type species of the new genus *Maeoproctis.*

***Maeoproctis subfasciata* (Walker) comb. nov.**
(Image 11–17)

Artaxa subfasciata Walker, 1865, *List Spec. Lepid. Insects Colln. Brit. Mus*., 32: 332.

Euproctis subfasciata Hampson, 1892, *Moths India*, 1: 472; Collenette, 1934, *Novit. Zool*., 39: 142; Chao, 2003, *Fauna Sinica*, 30: 412–413.

Artaxa trifasciata Moore, 1879, *Descr. Indian Lepid. Atkison*, 1: 51.

Type Locality: India (Sikkim)

Diagnosis: Forewing with faint medial band; vein M_2 just above lower angle of cell. Male genitalia with large, V-shaped saccus; juxta with two flap-like projections.

Description:

Male: Body length: 8–16 mm; wing expanse: 34–40 mm.

Female: Not examined.

Head with vertex and frons clothed with creamish scales. Labial palpi fringed with fulvous scales. Antennae with scape and flagellum covered with fulvous scales. Thorax, collar and tegula suffused with fulvous scales, underside paler. Legs dressed with creamish scales. Abdomen furnished with black scales, underside with creamish scales; anal segment fringed with yellow scales. Forewing with ground colour creamish-white; nearly obsolete medial band. Hindwing with ground colour white, without any marking. Forewing with Cu_2 from beyond two-third of cell; Cu_1 from well before lower angle of cell; M_3 from lower angle of cell; M_2 just above lower angle of cell; M_1 from upper angle of cell; R_5-R_2 well stalked before upper angle of cell; R_1 from three-fourth of cell. Hindwing with Cu_2 from well beyond middle of cell; Cu_1 and M_3 shortly stalked from lower angle of cell; M_2 from well above lower angle of cell; M_1 and Rs well stalked from upper angle of cell; $Sc+R_1$ from base of wing anastomosing with cell well before its middle.

Male genitalia: Uncus represented by two narrow, long processes, widely apart making U-shaped appearance, well-sclerotized, tips nearly pointed; tegumen broad, both arms medially dilated, V-shaped, having quite small protrusions along lateral sides of uncus; vinculum quite narrow ending into large, vase-like saccus; juxta moderately sclerotized, represented by two flap-like projections. Valva simple, short and broad; moderately-sclerotized; distal end bifid with two setosed processes, one shorter and other longer. Aedeagus small, moderately sclerotized; proximal end rounded; ductus ejaculatorius entering near proximal end; vesica armed with a well-sclerotized prominent spur and a patch of numerous spines.

Material Examined: (7 males): Himachal Pradesh: Basantpur, 2,148 m, 31.208°N & 77.174°E, 09.vii.2013, 1 male; Chamunda Devi, 1,000 m 31.926°N & 76.087°E, 07.ix.2013, 2 males; Dhuan Devi, 1,653 m, 31.661°N & 77.012°E, 16.ix.2014, 1 male; Janitri, 2,100 m, 31.699°N & 76.804°E, 13.v.2015, 1 male; Naina Tikkar, 1,552 m, 30.804°N & 77.119°E, 05.vii.2014, 1 male; Urla, 1,189 m, 31.921°N & 76.878 °E, 17.v.2015, 1 male. Coll. Gagan Bali.

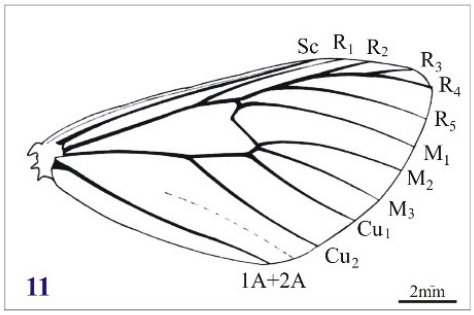
Distribution: India: Assam, Himachal Pradesh, Sikkim, West Bengal; China (Walker 1855; Hampson 1892; Chao 2003).

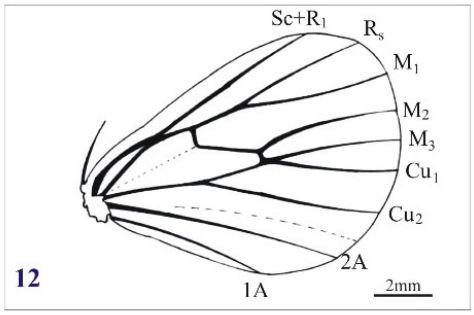
Remarks: Walker (1865) originally described this species under the genus *Artaxa* Walker from Sikkim. Hampson (1892) synonymised it under the genus *Euproctis* Hübner. Collenette (1934) and Chao (2003) followed the same nomenclature. In the present study, the status of the species *subfasciata* Walker has been updated by placing it under the new genus *Maeoproctis*. It is closely allied to *Maeoproctis latifascia* (Walker) comb. nov. in general appearance and can be easily differentiated on the basis of presence of a faint medial band on forewing. Its collection from Himachal Pradesh is its first record from northwestern India.

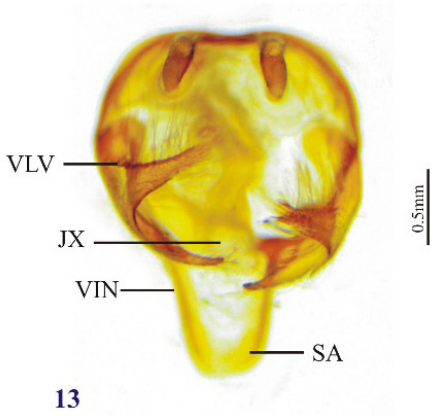
DISCUSSION

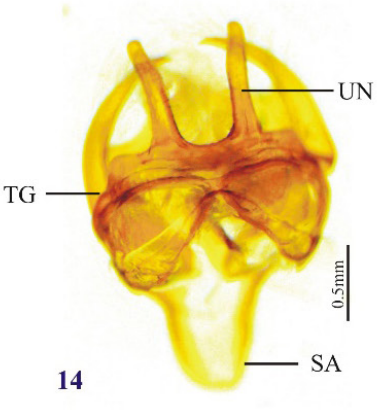
Hübner (1819) established the genus *Euproctis* with *Bombyx chrysorrhoea* Linnaeus as its type species from Europe. It is a large, diverse, and complicated genus comprising of more than 100 species (Chao 2003). Wang et al. (2015) also confirmed its polyphyletic nature. The taxonomic position of the species under reference

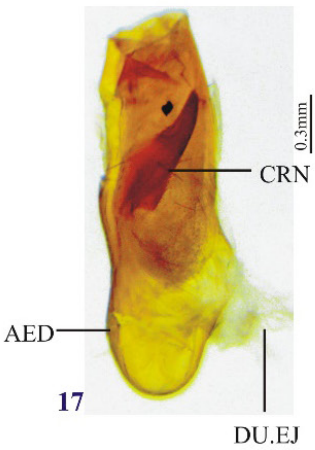
1.3 of Actual Size

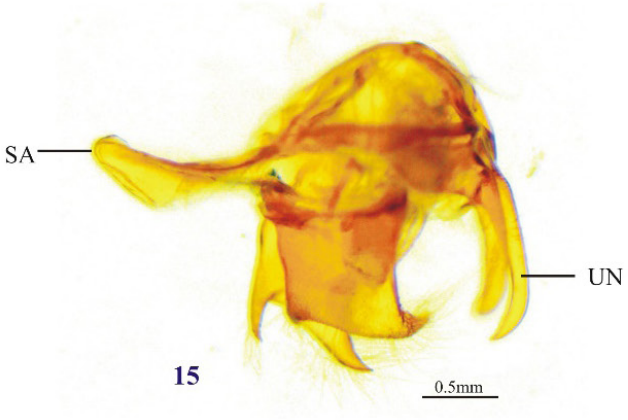












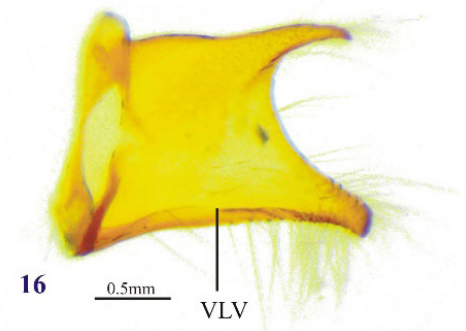


Image 11–17. *Maeoproctis subfasciata* (Walker) comb. n.: 11—Forewing | 12—Hindwing | 13—Male genitalia - ventral view | 14—Dorsal view | 15—Lateral view | 16—Valva | 17—Aedeagus.

is ambiguous as these species do not conform to the characterization of the genus *Euproctis* Hübner. The new genus, *Maeoproctis*, is also distinct from its allied genera namely, *Somena* Walker, *Orvasca* Walker, and *Sphrageidus* Maes, due to the presence of vein M_2 in the hindwing which is absent in all the three genera (Holloway 1999). The new genus is well defined on the basis of male genitalic features such as uncus with two narrow widely apart processes; short and distally bifid valva, and distinct tegumen. The taxonomic placement of species like *Euproctis latifascia* (Walker) and *Euproctis subfasciata* (Walker) has also been justified. Though the genus *Euproctis* Hübner is closely allied to the new genus in general appearance and wing venation, but it is distinct in terms of its male genitalic features such as unified uncus and simple uni-lobed valva. Chao (2003) outlined the genitalic characters of 103 species under the genus *Euproctis* Hübner in 'Fauna Sinica'. Out of these, the three species namely *hypoenops* Collenette, *schaliphora* Collenette, and *seitzi* Collenette also completely conform to the characterization of the new genus *Maeoproctis* and can be transferred under it.

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