INT. J. BIOL. BIOTECH., 3 (3): 537-541, 2006.

REDESCRIPTION OF *EUPROCTIS DIVISA* WALKER (LEPIDOPTERA: LYMANTRIIDAE) WITH DIVERSITY FROM PAKISTAN

S.Nargis Viqar[1], S.Kamaluddin[2], Kr.A.B. S. Khan[2] and Aliza Ali[1]

[1]*Department of Zoology, Government Degree College for Women, Block-M, North Nazimabad, Karachi, Pakistan*
[2]*Federal Urdu University of Arts, Science and Technology, Gulshan-e-Iqbal Campus, Karachi, Pakistan*

ABSTRACT

The *Euproctis divisa* Walker is redescribed first time from Pakistan with special reference to its head, venations of fore and hind wings, male and female genitalia and diversity are also briefly discussed.

Key words: *Euproctis divisa*, Lepidoptera, Lymantriidae, Redescription, Diversity, Pakistan.

INTRODUCTION

Walker (1855) described *Euproctis divisa* and kept it under the family Liparidae. Butler (1875) described genus *Euproctis* under the family Liparidae with the remarks that this genus differs from typical genus *Porthesia* Stephen in the forewing being more regularly triangular, the costa more arched. Moore (1882) described the genus *Euproctis* with only four species recorded from Ceylon under the family Liparidae. Cotes and Swinhoe (1887) in their catalogue of the moths of India, listed genus *Euproctis* alongwith twenty six species including *Euproctis divisa* Walker recorded from Nepal, Punjab and Sylhet. Westwppd (1889) listed genus *Euproctis* Hubner with only three species under the family Liparidae. Hampson (1892) described briefly forty-six species from Oriental region from Sikkim and Nagas. Lefroy (1909) kept the genus *Euproctis* under the family Lymantriidae and stated that the genus *Euproctis* includes a large number of small to moderate sized white, yellow, brown or orange moths. Seitz (1913) also described genus *Euproctis* under the family Lymantriidae alongwith *E.divisa* recorded from Nagas. Imms (1957) narrated that larvae of *Euproctis* is provided with urticating hairs composed of barbed spicules. It appears in uncertain weather. Their irritating properties are mechanical only, or are partly due to a poisonous secretion bathing these spiclues. Chaudhry *et al.* (1960) reported only three species under the genus *Euproctis* viz, *E. xanthorrhoea* Koll, *E. fraternal* Moore and *E. scintillans* Walker of the family Lymantriidae. This genus was recorded from Hazara, Balakot, Swat and Kalam. Janjua and Chaudhry (1964) listed the genus *Euproctis*, under the family Lymantriidae as a serious pest of apple in N.W.F.P region, almond and pomegranate from Quetta division, apricot from Gilgit, peach from Peshawar division and Gilgit agencies, pear and plum from Peshawar division and suggested how to control them. Farb (1964) listed *Euproctis* and discussed how this genus is attracted on light and specially light of candle or bulb. Maniu (1968) discussed genus *Euproctis* and stated that repugnatorial glands produced irritant or corrosive secretions used in defence and are commonly found and these glands are generally located in conspicuous wards, with tufts of stiff hairs in the caterpillars of *Euproctis.* Hill (1975) discussed the genus *Euproctis* as a minor pest of Castor, Cotton and Sweet Potato in African region under the family Lymantriidae. Atwal (1976) listed some species of the genus *Euproctis* under the family Lymantriidae as a pest of Pulse crops and Castor. Watson *et al.* (1980) listed the genus *Euproctis* under the family Lymantriidae. Helgard (1991) described genus *Euproctis* under the family Lymanbtriidae. Hashmi and Tashfeen (1992) gave a checklist of moths and listed twenty-four species of genus *Euproctis* along-with *E.divisa* under the family Lymantriidae recorded from Northern area of Pakistan. Kamaluddin *et al.* (1997a) attempted generic revision of the family Lymantriidae from Pakistan and adjoining areas with reference to brief description including head, wing venations, male and female genitalia, distributional range and their relationships of twenty-three genera. In (1997b) the same authors also attempted a review with reference to a key and cladistic analysis of all the twenty-three genera of family Lymantriidae. Young (1997) listed and discussed *Euproctis divisa* Walker along-with *Euproctis chrysorrhoea* L., under the family Lymantriidae.

In the start of twenty first century Mc. Gavin (2000) discussed the biology of species of the genus *Euproctis* and kept this genus under the family Lymantriidae. Picker *et al.* (2002) discussed the family Lymantriidae as Tussock moths and Gypsy moth and stated that the members of this family have reduced proboscis, abdomen and thorax are densely covered in barbed hairs.

MATERIAL AND METHOD

The adult specimens of *Euproctis divisa* Walker, were collected with the help of light trap from Donga Gali, Pakistan and were identified with the help of standard literature as mentioned in references. For the study of sex genital complex the abdomen was excised at the base and boiled in 10% KOH solution for about 5-minutes and then washed with tap water. The genitalia was removed from the abdomen for detail examination and later individual elements of the genitalia and the associated structures were removed as required and examined, diagrams were made using ocular grid under leitz weitzler dissection microscope with pelican ink.

RESULT

Genus: *Euproctis* Hubner

Euproctis Hubner, 1816, *Verz. Bekannter Schmett*: 159; Hampson, 1892, *Faun. Brit. Ind. Moths. 1*: 459; Watson *et al.,* 1980 *Brit. Mus. Nat. Hist. 2*: 72.

Diagnostic features:

Body generally yellow with brownish ochraceaus, fore wings large somewhat triangular shaped, frons convex, palpi obliquely porrect, reaching much beyond the frons, antennae bipectinate in both sexes, the branches long in males, fore wings with veins R2, R3, R4 and R5 usually originate from upper angle of cell, M2 and M3 wide apart and originate from lower angle of cell, hind wings small, with veins Rs and M1 stalked, mid tibiae with one pair of long spurs and hind tibiae with two pairs of spurs. Abdomen elongate apically with tuft of hairs. Tegumen large somewhat rectangular-shaped, parameres distally bifurceated with narrowed tips, uncus sclerotized with pointed tip, gnathos reduced, aedeagus large tube-like, a small lobe-like dorsal membranous lobe.

Comparative note:

This genus is most closely related to *Imaus* Moore, in having palpi never upturned, fore wings with veins 10 11 stalked but it can easily be separated from the same in having antennae with branches long in males, hind wings with veins 3 and 4 stalked from near angle of cell, vein 5 arising from upper angle of cell and by the other characters as noted in the description.

Type Species: *Euproctis chrysorrhoea* L.,

Euproctis divisa Walker
(Figs. 1-9)
Euproctis divisa, Walker, 1855, *Cat. Lep. Het. B. M. 4*:836.

Colouration:

Body (**Fig.1**) generally white, except broad black stripes on abdomen, golden tufts on apical abdominal segment, fore wings with dark brown venations and two parallel oblique lines.

Head (**Fig. 3**):

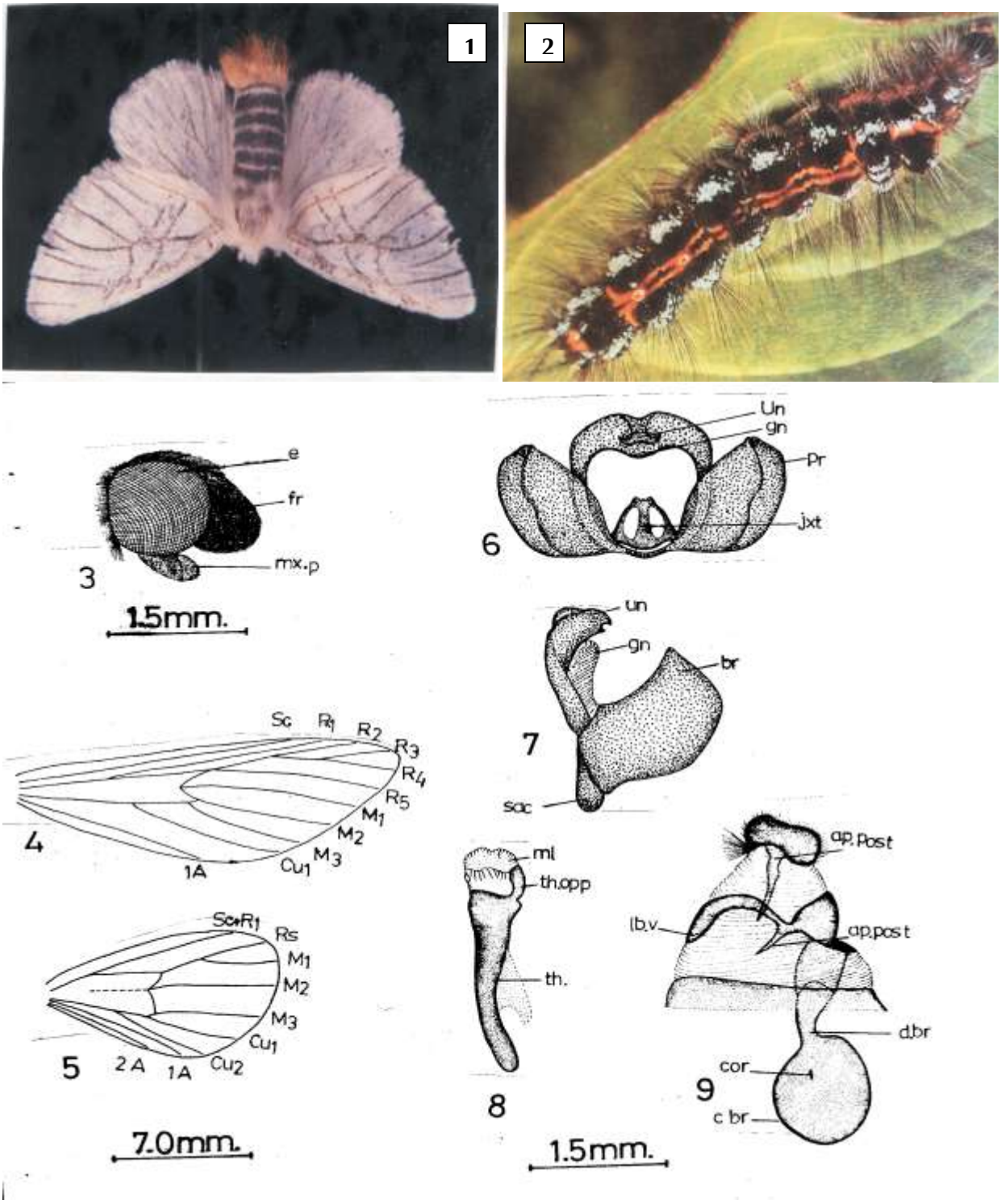
Eyes large, frons lobately produced antero-ventrally beset with thick hairs, maxillary palpi broad, basal segment short, apical segment anteriorly rounded about 2x the length of 2nd segment, proboscis reduced and concealed.

Fore wings (**Fig. 3**):

Large, somewhat triangular shaped, anterior angle sub-acute, veins R3 and R4 stalked, later stalked with R2 and originate from upper angle of cell and anastomosing with R5, M2 originates from lower angle of cell, only one cubital vein (Cu1) and anal vein (1A) are present.

Hind wings (**Fig. 4**)

Small, oval shaped, outer margin convex, veins Rs and M1 largely stalked and originate from upper angle of cell, M3 originates from lower angle of cell, Cu1 originates just below lower angle of cell, two anal veins (1A and 2A) are present.



Figs. 1-9. *Euproctis divisa* Walker., 1. entire dorsal view; 2. larvae, lateral view; 3. head, lateral view; 4. fore wings, dorsal view; 5. hind wings, dorsal view; 6. tegument, ventral view; 7. same, lateral view; 8. aedeagus, lateral view; 9. female genetalia, lateral view.
Key to the letterings: ap. Ant. (apophysis anteriors), ap.post. (apophysis posteriors), ant. (antenna), c.br. (corpus bursae), d.br. (ductus bursae), e. (eye), f. (frons), int. sgn. (inter-segmental membrane), mxp. (maxillary palpi), p.an. (papillae anales), 1A-3A (anal veins 1 to 3), Cu1 and Cu2 (cubital veins 1 & 2), M1-M3 (median veins 1 to 3), R1-R5 (Radius veins 1 to 5), Rs. (radiko-suctorial vein), Sc. (subcostal vein).

Male genitalia (**Figs. 6-8**)

Tegumen (**Figs. 6 & 7**) womewhat oval shaped, saccus short without saccular process, uncus inwardly curved, bifurcated, anchor-shaped, dorsally humbed, gnathos reduced, membranous, parameres large, broad, distally pointed, juxta triangular shaped; aedeagus (Fig. 8) with theca tubular, distally broad with finger-like thecal appendage membranous lobe broad without cornuti.

Female genitalia (**Fig. 9**)

Papilae anales rectangular-shaped with small hairs, a bunch of hairs present at dorso-anterior margin, lobus vaginalis narrow, lobe-like, apophyses posteriors large medially dilated and about 2x the length of apophyses anteriors, both apically pointed, ductus bursae short, broad, gradually narrowed towards posterior end, corpus bursae oval-shaped with a small cornuti.

Material examined:

Five males and two females, Pakistan, Donga Gali, on light, 22-07-2003, Aliza Ali and Syed Viqar Ali, lodged at authors collections.

Comparative note:

This species is most closely related to *Euproctis chrysorrhoea* L., in having general body shape, fore wings with zig-zag patches, palpi with 2nd segment much longer than 3rd, but it can easily be separated from the same in having only anal area of hind wings reddish, veins M3 and Cu1 very wide, only M3 originates from lower angle of cell and by the other characters as noted in the description.

Diversity:

This species (**Fig. 1**) is recorded from Donga Gali in between the range of 2400 m above sea level. The population is very high during July and August and less in December and January. The temperature ranges during summer 17C and in winter 1C, while average annual temperature is 12C. Amount of precipitation is 1300-1400 mm or sometimes to about 1450mm. Average relative humidity (mean) at 1200 UTC 61%.

DISCUSSION

Genus *Euproctis* Hubner is distributed in Palaearctic, Oriental and Australian regions mostly on high altitude, this genus plays sister group relationships with *Cispia* and *Imaus* by its synapomorphies the hind wings with veins R5 arising from upper angle of cell. Hampson (1892) recorded 46 species of the genus *Euproctis* from Oriental region. Among these only 14-species are distributed in Indo-Pakistan subcontinent. This species is very closely related to *E.chrysorrhoea* by their synapomorphies like fore wings with zig-zag patches, palpi with 2nd segment much longer than 3rd segment but by its autapomorphies like anal area of hind wing reddish and vein M3 and Cu1 very wide and only M3 originates from lower angle of cell.

REFERENCES

Atwal, A.S. (1976). *Agricultural pests of India and South East Asia*, Kalyani publishers, Ludhiana, 1:178,pp502.

Butler, A.G. (1875). Descriptions of several African and Australian Lepidoptera in the collection of the British Museum. *Ann. Mag. Nat. Hist.,* 19: 458-462.

Chaudhry, G.U., M.I. Chaudhry and S.M. Khan (1960). Survey of insect fauna of forest of Pakistan. Final technical report *Biol. Sci. Res. Div.,* 1:167pp.

Cotes E.C. and C.C. Swinhoe (1887). A catalogue of the moths of India *Sphinges 1*:810pp. Calcutta.

Dennis. H. (1975). *Agricultural Insect Pests of the tropics and their control*. Cambridge. 517pp.

Farb. P. (1964). *The Insects, time-life international, Nederland*. 191pp.

Hampson, G.F. (1892). The fauna of British India including Ceylon and Burma, *Faun. Brit. Ind. 1*:Frances and Taylor :pp490.

Hashmi, A.A. and A. Tashfeen (1992). Lepidoptera of Pakistan. *Proc. Pakistan. Congr. Zool. 12*:171-206.

Helgard, R. (1991). Field guide to Butterflies and Moths of Britain and Europe, The Crowood Press Ltd. 287pp.

Imms, A.D. (1957). *A text book of Entomology*. London, pp.886.

Janjua, A.N. and G. Chaudhry (1964). Biology and control of Hill fruit Insects of West Pakistan. Pp158.

Kamaluddin, S., I. Ahmad and S. Ahmad (1997a). A generic revision of the family Lymantriidae (Lepidoptera: Noctuoidea) from Pakistan and adjoining areas Pakistan. *J. entomol. Karachi,* 12(182):3-22.

Kamaluddin, S., I. Ahmad and S. Ahmad (1997b). A review and cladistic analysis of Lymantriid genera from Pakistan and adjoining areas. *Proc. Pakistan Congr. Zool. 17*:271-279.
Lefroy, H.M. (1909). *Indian Insects life*. W. Thanckers and Co. London pp.786.
Mani, M. S. (1968). *General Entomology*. Oxford and IBH publishing Co. (Pvt.) ltd. Calcutta,m pp.912.
Mc. Gavin, G. (2000). *Insects spiders and terrestrial Arthropods*. Dorbing kinder sley, Inc. Singapore, pp.256.
Moore, F.D. (1882). The Lepidoptera of Ceylon. Lomndon, *2*:77-101.
Picker, M., C. Griffiths and A. Weaving (2002). *Field guide to insects of South African.* Singapore, pp440.
Seitz, A. (1913). In: A Die Gross-Schmetterlinge der Erde (Seitz)., *2*:89-103. Suttgart.
Walker, F. (1855). List of the specimens of lepidopterous insects in the collection of the Moth, *Brit. Mus. 2*:279-581. London.
Watson, A., D.S. Fletcher and I.W.B. Nye (1980). The generic names of the world. *Br. Mus. (Nat. Hist.), 2*:108.
Westwood, J.O. (1889). The Transactions of the Entomological Society London, Congress green reader and Dyer, London, 1*:*466,pp.592.
Young, M. (1997). *The Natural History of Moths*. T& AD Poyser, Nat. Hist

(*Accepted for publication April 2006*)