INT. J. BIOL. BIOTECH., 2 (3): 541-544, 2005.

CONTROL AND GENITAL STUDY OF LEOPARD MOTH, *ZEUZERA MULISTRIGATA* MOORE (LEPIDOPTERA : COSSIDAE : ZEUZERINAE) FROM PAKISTAN

S. Nargis Viqar[1], S. Kamaluddin[2] and Nadeem Baig[2]

[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

Zeuzera mulistrigata Moore, is recorded from Pakistan and described in detail with special reference to its head appendages, venation of fore and hind wings and male genitalia. The systematic position life cycle, diversity in Pakistan and its control are also briefly discussed.

Key words: *Zeuzera mulistrigata* Moore. Cossidae, Zeuzerinae, diversity, control, genitalia, Pakistan.

INTRODUCTION

Moore (1882-3) described genus *Zeuzera* and its two species under the family Cossidae. Cotes and Swinhoe (1888) have been listed genus *Zeuzera* and fifteen species along with *Z. mulistrigata* under the family cossidae. Hampson (1892) has been described genus *Zeuzera* along with five species including *Z. multistrigata* under the family cossidae and explained only morphology and wing venations of said species recorded from Dharamshala, Sikkim and Nagas. Chaudhry *et al.* (1966) have been listed two species of *Zeuzera* i.e. *Z. coffea* and *Z. multistrigata* recorded from Bangladesh and in the trunks of Walnut at Atror (Swat), Peshawar and Azad Kashmir. Dennis (1975) defined two species of *Zeuzera* under the family cossidae as a pest and their control. Helgard (1991) has been listed and illustrated one species of *Zeuzera* ignoring *Z. mulistrigata* recorded from Britain and Ireland. Hashmi and Tashfeen (1992) have been listed *Zeuzera mulistrigata* along with other species of genus *Zeuzera* under the family cossidae. Young (1997) stated that the larva of *Z. muistrigata* feed in a tree trunk. Edward, *et al.* (1999) described genus *Zeuzera* under the subfamily Zeuzerinae of the family Cossidae. Picker *et al.* (2002) have been described four genus of family cossidae ignoring *Zeuzera*. Carter (2003) illustrated only one species *Z. pyrina* Linnaeus under the family cossidae.

MATERIALS AND METHODS

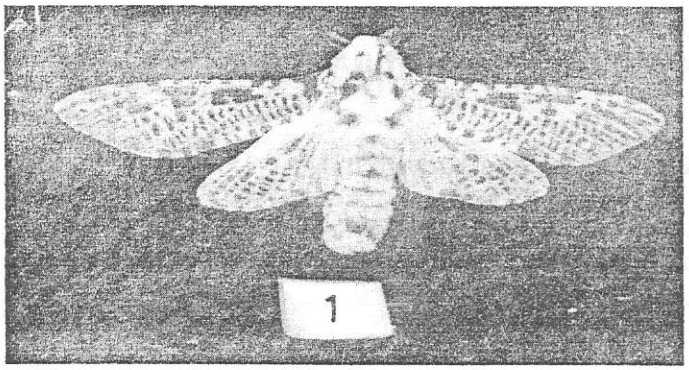
The adult specimens of *Z. mulistrigata* Moore were collected with the help of light trap from Donga Gali, Pakistan and were identified with the help of available literature as mentioned in references. For the study of sex genital complex the abdomen was excised at the base and boiled in 10% KOH solution for about 5-minutes and then washed with tap water. The genitalia were removed from the abdomen for detail examination and later individual elements of the genitalia and the associated structures were removed as required and examined. Using ocular grid under leitz weitzler dissection microscope on a graph paper, which later were transferred on drawing sheet and finalized with pelican ink, made drawings. All the diagrams are to the given scale.

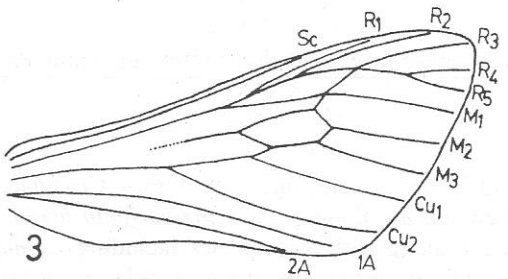
RESULTS

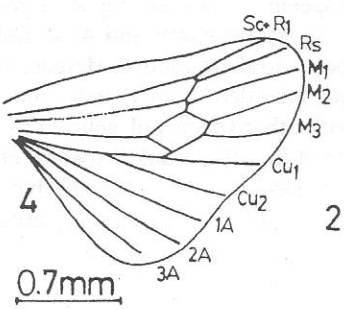
Genus : *Zeuzera* Latreille.
Zeuzera, Latreille. 1802, *Hist. Nat. des Ins.* xiv, p.175.
Latagia, Hubner. 1818, *Verz. Bek. Schmett* P.196.

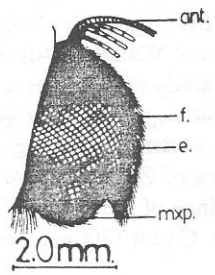
Diagnostic features

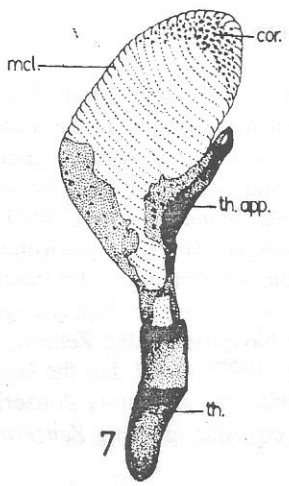
Palpi absent or very small, legs without spurs, forewings elongated, narrow, costal and subcostal veins very close together at base, two cells present, hind wings much shorter than fore wings, single cell is present, three anal veins are present, in males uncus and gnathos well developed, paramere large, lobe-like, aedeagus with theca short, thecal appendage well developed, membranous conjunctival lobe large with cornuti.

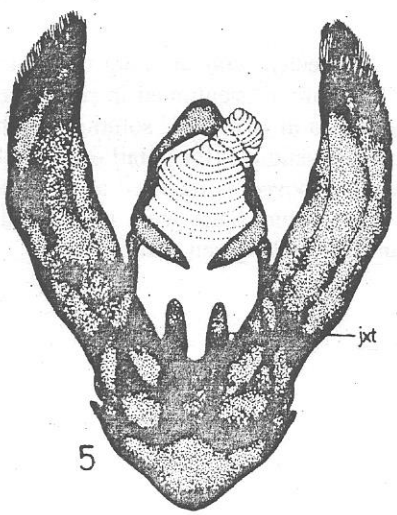


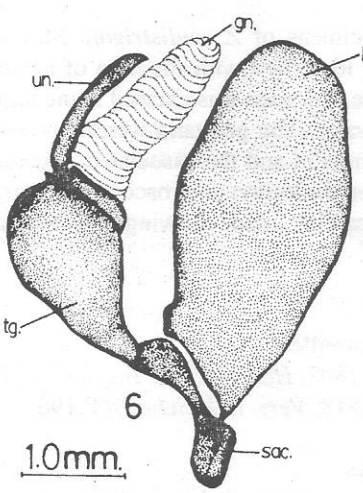












Figs.1-7. *Zeuzera mulistrigata* Moore., 1. Adult, entire dorsal view; 2. head, lateral view; 3. fore wing, dorsal view; 4. hind wing, dorsal view; 5. tegumen, ventral view, 6.same, lateral view, 7.aedeagus, lateral view, .

Key to the laterings

ant. (antenna), e. (eye), fr. (frons), gn. (gnathos), jxt. (juxta), mcl.(membranous conjuctival appendage), mx.p. (maxillary palpi), pr.(paramere), sac.(saccus), tg. (tegumen), th. (theca), th.app. (thecal appendage), un.(uncus), 1A - 3A. (anal vein 1, 2 and 3), Cu1 & Cu2 (cubital vein 1 and 2), M1-M3 (median vein 1 to 3), R1-R5 (radius vein 1 to 5), Rs.(radio-suctorial vein), Sc.(sub-costal vein), Sc+R1(sub-costal and radius vein 1).

Comparative note

This genus is most closely related to genus *Azygophleps* in having eyes large, Mixillary palpi minute, abdomen elongated, fore wings long and narrow with apical angle sub-acute Sc and R1 parallel to each other and well separated, two anal veins present, hind wings a distal cell present, three anal veins are present, tegumen broad, juxta trilobed, aedeagus with theca short but it can easily be seprated from the same in having body generally light yellow, frans broadly rounded, proboscis reduced, fore wings with veins R4 and R5 largely stalked, later anastomosing with R3 and originates from upper angle of cell, hind wings with vein M2 originates from lower angle of cell, uncus beak shaped, saccus broad, paramere broad apically tuff of hairs, aedeagus with well developed thecal appendages and by the other characters as noted in the description.

Type species : *Zeuzera asculi* Moore.

Distribution : Oriental and Palaearctic regions.

***Zeuzera mulistrigata* Moore**
(Figs.1-7)
Zeuzera multistrigata, Moore, Proc. Zool. Soc. Lond.1881, p.327.
Zeuzera indica, Walker, Cat. Lep. Het. B.M.vii, 1856.

Colouration

Body generally brownish yellow with black patches all over the wings and body.

Head

Eyes large, smooth without lashes, frons broadly rounded ventral acutely produced, maxillary palpi reduced, 2nd labial segment much longer than 3rd segment, proboscis reduced (**Fig. 2**).

Fore wing

Fore wing (**Fig. 3**) with apical angle sub-acute, veins Sc and R1 parallel to each other and well separated, R4 and R5 largely stalked, later anastomosing with R3 and originating from upper angle of cell, M2 originates from lower angle of cell, Cu1 and Cu2 wide apart and parallel to each other, two anal vein (1A and 2A) are present.

Hind wing

Hind wing (**Fig. 4**) with apical angle broad, veins Sc+R1 slightly wide apart from vein M2 originates from lower angle of cell, a distict cell present at base of M2 and M3 vein, three anal veins are present.

Abdomen

Abdomen elongated, brood, apically gradually narrowed without tuft, apex rounded with small scales.

Body size

Body size (**Fig.1**) is 46-48mm in wing expansion.

Male genitalia

Tegumen (**Figs. 5 & 6**) broad, uncus beak shaped, shorter than large membranous lobe-like gnathos, juxta trilobed, median lobe short, bifurcated, saccus broad, cup-shaped, paramere large, broad apically tuff of hairs, aedeagus (**Fig. 7**) with theca short, bilobed well developed thecal appendage, membranous conjunctiva large broad with cornuti at basal and apical area.

Material examined

Five male, Pakistan, Donga gali, on light, 13-07-2003, leg. Syed Viqar Ali, lodged at Ali Museum of Insecta, Karachi.

Comparative note

This species is most closely related to *Z. postexcisa* Hampson in having general body shape, eyes large, palpi reduced but it can easily be separated from the same in having head, thorax and abdomen pure white, collar with paired blue-black marks, fore wings white, with numerous small round blue-black spots, marginal series prominent,

hind wings white some small obsolescent spots beyond the cell and by the other characters as noted in the description.

Larva

Larva is covered in conical granules with minute apical spines, often yellowish colour. The full-grown larva is about 38mm long. They are leaf eater. The caterpillars often feed with their head. They move about on the plant a great deal and may attack ten or more squares during the larval period. The Pupa is about 15mm long, pupal period usually lasts 12-15 days.

Life cycle

There are six larval instars, and the total larval period usually lasts 15-22 days, but as long as forty-six days at 17°C. Moulting normally takes place on the upper surface of leaves during daylight hours. Egg lays starts about four days after emergence and may continue for a further ten days.

Diversity

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

Control

Take cheap type of washing soap about 1-2 Lbs and dissolve it in a small quantity of water often cutting it into thin slices. During winter, water may be boiled to dissolve soap. The amount of soap to be used depends on the degree of infestation. In case of a light infestation weaker solution may suffice. It is a weak contact poison but is very useful to control this insect.

DISCUSSION

The representatives of the genus *Zeuzera* Latreille are distributed in Palaearctic and Oriental regions and closely related to *Azygophles* Hampson by their general appearance and palpi minute but its apomorphies the fore wings with large patches, frons more produced clearly isolated from the *Azygophes.* Among the genus *Zeuzera* the species *multistrigata* Moore, appears sister group relationships to *postexcisa* Hampson, by their synapomorphic chara hind wing with the outer margin deeply excised near anal but plays out group relationships by their autapomorphies like, veins R4 and R5 in fore wings largely stalked, in hind wings the M2 originates from lower angle of cell, the aedeagus with large finger-like thecal appendage, dorsal membranous lobe large with dots-like cornuti at apex, uncus beak-shaped shorter than large membranous gnathos.

REFERENCE

Carter, D. (2003). *Butterflies and Moths*. London, 304 PP.

Chaudhry, G.U., M.I. Chaudhry and S.M. Khan (1966). Survey of insect fauna of forest of Pakistan. Final technical report *Biol. Sci. Res. Div. 1*:167 pp

Cotes. E.C and C.C. Swinhoe (1888). *A catalogue of the moths of India*. Cat . Moths Ind. Bombyces,

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

Edward. E.D., G. Papricia, H. Marianne and P. Niels (1999). in Lepidoptera, Moths and butterflies, New York, *Nat. Hist. Mus., 1*: 181-197.

Hampson (1892). The fauna of British India including Ceylon and Burma. *Faun. Brit. Ind. 1*: Frances and Taylor: 490.pp.

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

Helgard, R. (1991). *Field guide to Butterflies & Moths of Britain and Europe, with over 700 illustrations of 468 species*. Revised English edition, the Crowood press Ltd. 287pp.

Moore, F. D. (1882-83). *The Lepidoptera of Ceylon*. London, Vol.2 pp 77-101

Picker, M., C. Griffiths and A. Weaving (2002). *Field guide to insects of South Africa*. Singapore, 440 pp.

Young, M. (1997). *The Natural History of Moths*. T & AD Poyser Natural History, London, 271: 160-161.

(Accepted for publication June 2005)