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AMAZING LONG TAILED HINDWINGS BIG MOTH, *ACTIAS SELENE* (HUBNER) (LEPIDOPTERA: SATURNIIDAE) DISCOVERED FROM PAKISTAN

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ABSTRACT

Actias selene Hubner is described in detail with special reference to its larva, head appendages, venations of fore and hind wings, male and female genitalia. The life cycle, economic importance, control, systematic position and its cladistic relationship is also briefly discussed.

Key Words: Description, *Actias selene*, Saturniidae, Pakistan, economic importance, control, cladistic relationship

INTRODUCTION

Moore (1882) described only three genera under the family Saturniidae alongwith a genus *Actias* Leach, with only one species *selene* Hubner, as a pest of *Oadina wodier*. Cotes and Swinhoe (1888) described four species under the a genus *Actias* alongwith *selene* Hubner of the family Saturniidae, in the group Bombyces, recorded from Swinhoe, Simla, Belgaum, Darjiling, Matheran, Ceylon and China. Butler (1889) listed five genera including *Actias* Leach and *A. selene* Hubner under the family Saturniide, ignoring detail description. Hampson (1892) described seven-genera including *Actias* Leach, under the family Saturniidae accommodated three species including *A. selene* Hubner, recorded from N.America, Natal, Japan, China, Srilanka, Burma and India.

Seitz (1913) also described the genus *Actias* Leach under the family Saturniidae, along with *A. selene* Hubner, recorded from Srilanka. Chaudhry *et al.* (1970) described four genera under the family Saturniidae, alongwith *A. selene* Hubner, recorded from China, Srilanka, Burma, Hazara, Abbotabad, Chunjal Hill (Azad Kashmir), feeding on *Pyrus* spp. Walnut, *Betula, Lagerstroemia terminalia* and *Zanthoxylum*. Fletcher and Nye (1985) listed genus *Actias* Leach under the family Saturniidae, of the super family Bombycoidea. Hashmi and Tashfeen (1992) listed ten genera under the family Saturniidae along with genus *Actias* Leach, and one species *A. selene* Hubner. Minet (1986) described twenty one genera of subfamily Saturninae along with genus *Actias* under the family Saturniidae, in the group Noctuoidea.

MATERIALS AND METHODS

The adult specimens of *A. selene* Hubner were collected with the help of light trap from Swat, Pakistan and identified with the help of standard literature. For the study of sex genital complex the abdomen was excised at the base and boiled in 10% KOH solution for about 5 min. and then washed with tap water. The genitalia was removed from the abdomen for detailed examination and later individual elements of the genitalia and the associated structures were removed as required and examined, making diagram using ocular grid under Leitz Weitzler dissection microscope.

Genus *Actias* Leach

Actias, Leach, 1815, *Zool. Misc. II*, P.25
Tropaea, Hubner, 1818, *Verz.* P. 152
Plectropteron, Hutton, 1847, *Trans. Ent. Soc. V.* P.45.
Argena, Wallengr, 1858, *Ofe. Kongl. Vet. Ak.* P.140.

Diagnostic features

Large crepuscular-flying moth, proboscis absent or reduce, palpi minute, antennae bipectinated in both sexes, the branches long in males, legs short, hairy and without spurs. Fore wings with the apex produced and acute. Hind

wings with the anal angle produced into a long tail, veins M3, Cu1 and Cu2 being curved and running to the tip of the tail.

Comparative note

This genus is most closely related to *Attacus* L., in having body very large sized, proboscis absent or very reduced but it can easily be separated from the same in having hind wings with anal angle produced into long tail and the cell of both wings closed in contrast hind wings with anal angle not produced into a tail and the cell of both wings open in *Attacus* and by the other characters as noted in the description.

Type species: *Actias luna* L. Recorded from North America.

Distribution:

Nearctic and Oriental regions.

***Actias selene* (Hubner)**
(Figs. 1-3)

Echidna caudata selene, Hubner, 1806, *Sammul. Exot. Schmett. I.P*l. 172,3,4
Tropaea selene,Hubner, 1818, *Verz. Bek. Schmett*. P.152; Walker (1855) *Catal. Lep; Het. B.M.VI*. P.1262
Actias selene Leach, (1815) *Zool. Misc. II*. P.26,Pl.70; Moore, 1815 *Catal. Lep. Mus. E.I.C. II*. P.400, Pl, 19,

Colouration

Head, Thorax and abdomen white, palpi pink, prothorax with a dark pink band, legs pinkish.

Head

Eyes large, frons brodly convex, maxillary palpi shorter than frons, 2nd segment about 4X the length of 3rd, proboscis very short concealed between palpi. (Fig. 4)

Forewings

Forewings (Fig.5) triangular shaped with apical angle sub-roundly produced with a dark purple-brown costal band, the extreme edge of which is much the palest, crossed by a slender subbasal very indistinct darker green fascia and two discal similar fasciae, vein R1 originates separately, R2 and R3 largely stalked and originates from upper angle of cell, R4 originates above the upper angle of cell, R5 originates from upper angle of cell, M1 originates from lower angle of cell, Cu1 originates from near base of cell, only one anal vein "1A" is present.

Hind wings

Hind wings (Fig. 6) large with much elongated tail, a single discal similar fascia, the tail suffused with pink across the middle, vein R5 originates separately from much above upper angle of cell, M2 originates from upper angle of cell, M3 originates separately from middle of cell and enter into the tail, Cu1 originates from lower angle of cell, only one anal vein "1A" is present.

Male genitalia

Tegumen (Figs. 7 and 8) broad, cup-shaped, saccus narrowed cone-shaped, prolonged posteriorly with acute apex, without saccular process, uncus curved Vas-shaped with serrated dorsal margin beset with scattered hairs, gnathos short membranous, paramere very large bilobed, inner lobe produced posteriorly into thorn-like spine, outer lobe large, broad, apically truncated, beset with hairs, inner margin of paramere medially with a series of 7-spines, aedeagus (Fig. 9) large tubular,medially enclosed by membranous flap, thecal appendage cranulated, apex of theca produced into a thorn-like process, membranous conjunctiva large, lobe-like, apically narrowed, without cornuti.

Female genitalia

Papillae anales (Fig.10) lobe-like,beset with small hairs, apophysis posteriors moderate, thorn-like, straight slightly curved, apically club-shaped, ductus bursae S-shaped, medially dilated, corpus bursae large apple-shaped with two small triangular cornuti.

Materials examined

Two males, and one female, Swat, July 2002, on light, leg. S. Viqar Ali, lodged at Ali Museum of Insecta and Research center, Karachi.

Comparative note

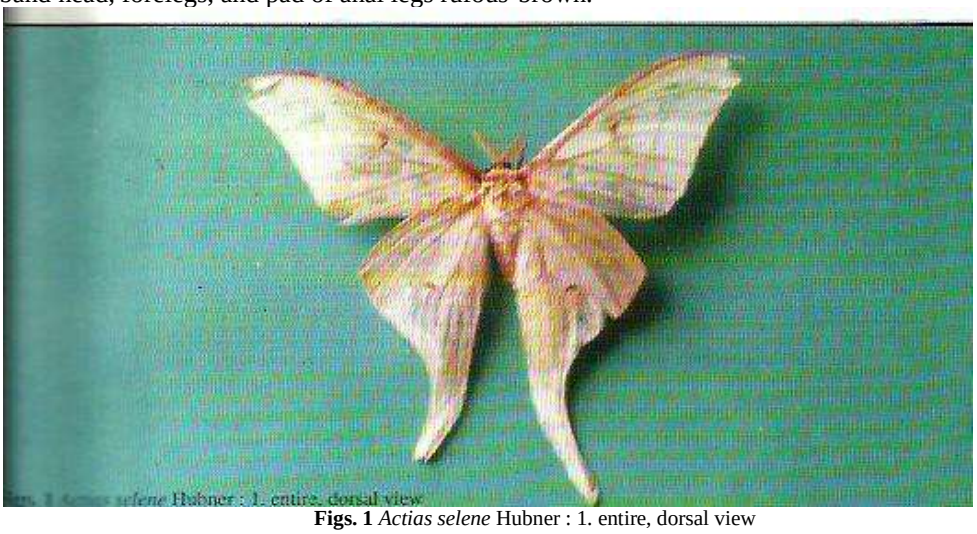
This species is most closely related to *A. maenas* Double in having general body shape and hind wings with large tail but it can easily be separated from the same in having fore wings very pale green and white at base, in male the inner median margin of tegumen with seven small spines, in female the apophysis anteriors apically club-shaped and by the other characters as listed in the description.

Body size

Body ranges160mm to170mm with wings expension (Fig. **1**)

Larva

Mature larva (Fig. **2**) smooth, apple-green, of a semitransparent, each segment except the anal with two dorsal and a sublateral spiny yellow tubercle, the tubercele also sparsely hairy, the hairs black, the back sides and beneath, as well as the legs with a few very fine hairs, those on the back yellow, the others black, on the anterior segments is a smaller subdorsal and lower sublateral tubercle, the dorsal tubercles on third and fourth segments golden-yellow, with a black band head, forelegs, and pad of anal legs rufous-brown.



Figs. 1 *Actias selene* Hubner : 1. entire, dorsal view

Cocoon

Cocoon (Fig. **3**) large, of an irregular oval-shape formed of coarse pale rusty brown silk closely interwoven, enclosed among the pale brown leaves of the tree.

Life cycle

Female *A. selene* Hubner lays 400-500 eggs in April on underside of leaves of host plant. Caterpillars hatch in early autumn. They feed leaves of plant. The life cycle from egg to adult lasts 45-70 days.

Flight

Generally July and August

Food Plant

Alnus nitida, *Pyrus* spp., *Juglans regia.*

Economic importance

The larvae of this caterpillar have been observed attacking leaves of *Alnus nitida* at Swat. When the attack is serious complete defoliation takes place resulting in less yield. It also affect the life of tree.

Control

Take one pound of lead arsenate powder in 100 litter of water. Make the powder as a thin cream in a small quantity of water, then add the full quantity of water and stir well, this insecticide should be sprayed by means of a

machine which has an automatic arrangement to stir the mixture and thus keep it in suspension, as lead arsenate is not soluble in water.

Lead arsenate is a stomach poison and is to be used against *A. selene* Hubner. It should be sprayed on the leaves of the plants and the *A. selene* feeding on them will die and very powerful against the larvae of such species.

The lead arsenate is a deadly poison and every care must be taken to keep it in a safe place. Domestic animals should not be allowed to feed on the sprayed plants. Lead arsenate should not be mixed with soap solution as it may cause sever burning of the foliage.

Fig.2.

Fig.3.

Figs. 2-3. *Actias selene* Hubner : 2. larva, lateral view; 3. Cocoon, lateral view;.

Key to the letterings: ap. ant. (apophysis anteriors), ap.post. (apophysis posteriors), ant. (antenna), c.br. (corpus bursae), cor. (cornuti), d.br. (ductus bursae), e. (eye), f. (frons), gn. (gnathos), gon. (gonad), mc. app. (membranous conjunctival appendage), mx. p. (maxillary palp), p.an. (papillae anales), prb. (proboscis), sac. (saccus), tg. (tegumen), th. (theca), th. app. (thecal appendage), uc. (uncus), 1A. (anal vein 1), Cu1 & Cu2 (cubital vein 1 and 2), M1- M3 (median vein 1 to 3), R1-R5 (radius vein R1 to R5), Rs (radio-suctorial vein), Sc. (sub-costal vein), Sc+R1 (sub-costal and radius vein 1)

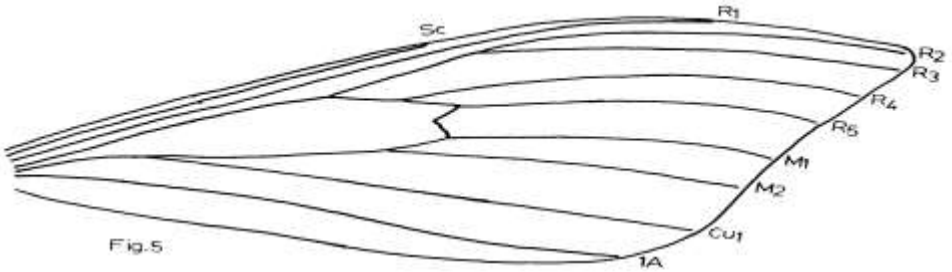


Fig.5

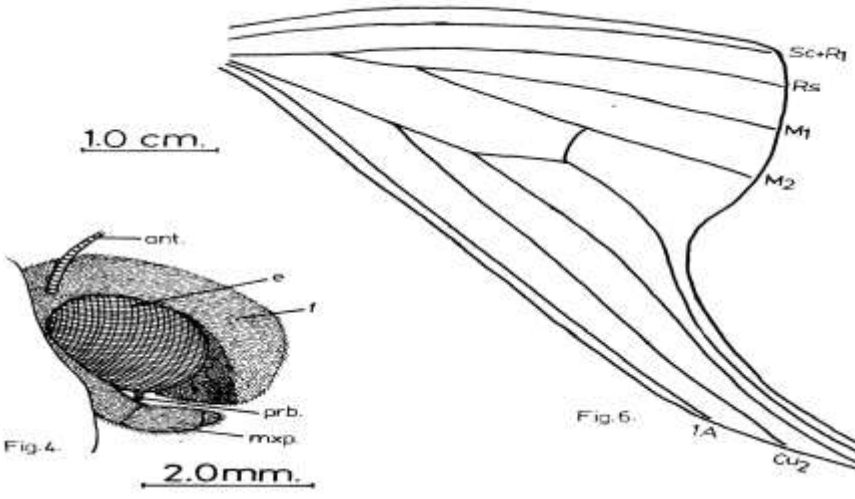
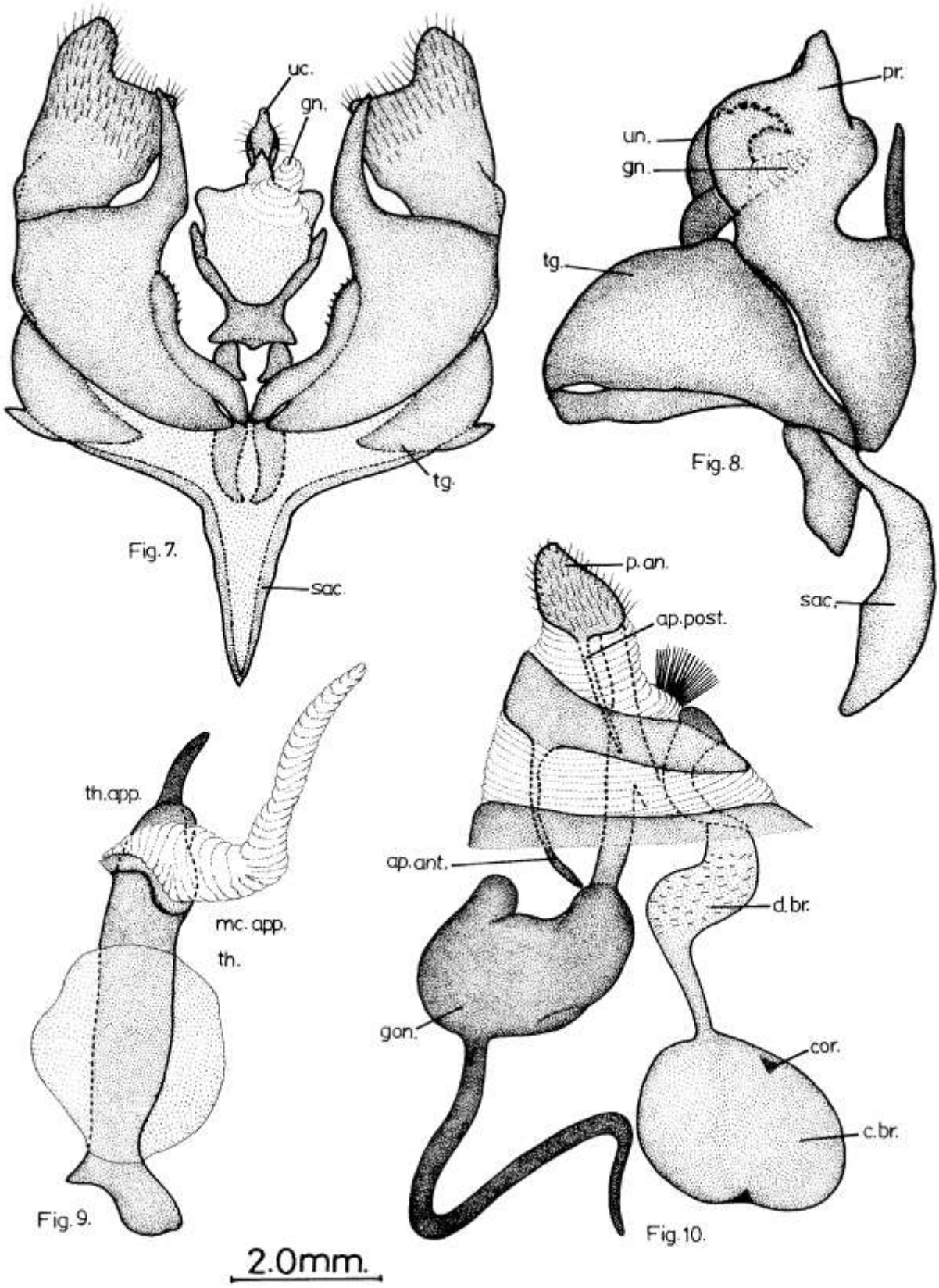


Fig.4.

Fig.6.

Figs. 4-6. *Actias selene* Hubner : 4. head, lateral view; 5. fore wing, dorsal view; 6. hind wing, dorsal view.



Figs. 7-10. *Actias selene* Hubner : 7. tegumen, ventral view, 8. same, lateral view, 9. aedeagus, lateral view; 10. female genitalia, lateral view.

DISCUSSION

The genus *Actias* Leach of the family Saturniidae includes only three species distributed in North America, Natal, Japan, China, Ceylon, Burma, Bhutan mostly on high altitude. The present species is recorded from Swat, Pakistan.

The present species *A. selene* Hubner isolated from other species *maena* Double and *ignescens* Moore by its autapomorphies head, thorax and abdomen white, fore wings very pale green, white at base, a dark pink costal fascia, hind wings large with much elongated tail, in males tegumen with cup-shaped saccus, aedeagus with thecal appendages cranulated, in females corpus bursae with two small triangular cornuti.

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