

## FIRST TIME DESCRIBED *ACHAEA JANATA* (LINNAEUS, 1758) FROM PAKISTAN (LEPIDOPTERA: NOCTUIDAE)

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### ABSTRACT

The first time described *Achaea janata* (Linnaeus, 1758) of the family Noctuidae from Pakistan with special references to its head components, maxillary palpi, frons, proboscis, wing venations of fore and hind wings and male and female genitalia. The relationship is also briefly discussed with references of its apomorphies.

**Key words:** *Achaea janata*, Lepidoptera, Noctuidae, relationship, Pakistan.

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### INTRODUCTION

Hampson (1892) has been synonymized the genus *Achaea* under the genus *Ophius* Ochs. Although, Flecher (1914) has described the biology and distribution of the representative of the family Noctuidae, and also discussed only one species *Achaea melicerta*. Similarly, Hubner (1816) defined the genus *Achaea* on the basis of superficial characters, coloration of entire body and brief description of male genitalia from tropical region and later on (Hashmi, 1983, 84; Hashmi and Tashfeen, 1992) listed two species *janata* and *serva* (F.) under the genus *Achaea* whereas, Edwards (1978) recognized two species *A. janata* and *A. serva* from Australia. Ramdev and Rao (1984) reported characterization of free amino acids in the haemo-lymph of fifth instar larva of moth *Achaea janata*. However, Muthukrishnan and Pandian (1984) described the effects of ration and temperature on the growth performance and bio-energetic of the last instar larvae of the same species. Yadwad and Kallapur (1988) determined Glutathione S-transferase activity was found in castor semilooper *A. janata* during their developmental stages after fenitrothion treatment. Whereas, Gaikwad and Bilapate in (1989) studied the mortality factors of castor semilooper *A. janata*. Later on, John and Muraleedharan (1993) studied the hormonal modulation of glycogen reserves in the fat body of larval, pupal and adult stages of moth of the same species.

Easton and Pun (1996) recorded 145-species of moth and newly recorded 127 species and also included one species of *A. serva* from the South-East China. However, Rose (2002) recorded 180 species of moths and *A. janata* of the sub-family Catacolinae from Jatinga, Assam, India. Srivastava (2002) studied the genital parts of Lepidoptera with a new technique of eversion vesica with aedeagus.

### MATERIAL AND METHODS

The male and female adults belonging to the genus *Achaea* were collected from different food plants like *Musa sapientum*, *Ricinus communis*, *Excoecaria agallocha* with the help of light trap (Malier, Karachi, June, 2007) and were identified from available literature (Holloway, 1979). For the study of genital complex, the routine procedure was adopted by Naz *et al.* (2007), Shakira and Kamaluddin (2012) and Shakira *et al.* (2014).

### RESULTS

#### Genus: *Achaea* Hubner

*Achaea*, Hubner, {1823} 1816 e: 269

#### Diagnostic feature:

Body generally brown except dark brown striation on fore wings, white and dark brown wide bands on hind wings; frons rounded proboscis large twisted, maxillary palpi large, 2<sup>nd</sup> segment much longer than basal and 3<sup>rd</sup> segment very short; fore wings with Sc and R<sub>1</sub> parallel to each other, R<sub>3</sub> and R<sub>4</sub> originate from upper angle of cell,

two anal veins are present; hind wings with vein  $M_1$  originate from upper angle of cell,  $M_3$  originate from lower angle of cell, three anal veins are present.

Male genitalia typical, uncus bi-lobed paramere with three processes, aedeagus with thecal appendage, membranous conjunctiva with small spine-like cornuti; well-developed apophyses found in female, papillae anales triangular shaped, ductus bursae short, corpus bursae bi-lobed.

**Comparative note:**

This genus is most closely related to *A. chrysopera* (Hampson, 1892) in having generally body color of fore wings and maxillary palpi up-turned but it can be easily separated from the same in having very short and knob-like 3<sup>rd</sup> maxillary segment, in male tegumen typical, in female well developed apophyses was found.

**Type species:**

*Phalaena melicerta* Drury

**Distribution:**

The distribution of this species is Oriental, Ethiopian region and Australian region.

**Coloration:**

Body generally brown except dark brown wavy striation on middle, and sub-apical broad band on fore-wings, white median and apical and dark brown wide basal and sub-apical bands on hind-wings as shown in Fig. 1.

**Wing expansion:**

Body size were measured 34 to 50 mm with wing expansion.

**Head:**

Head sub-rounded, palpi well developed, besets with scales, basal segment shorter than second, later about 5X the third segment, proboscis much longer and highly coiled was shown in Fig. 2.

**Fore wings:**

Fore wings much longer than hind wings, apical angle sub-rounded, outer margin sinuated, veins  $R_1$  and  $R_2$  largely stalked and originated from for beyond radius vein,  $R_3$  and  $R_4$  anastomosing and originating from upper angle of cell,  $M_1$  originates from lower angle of cell,  $Cu_1$  parallel to  $M_2$ , only one anal vein ( $A_1$ ) is present, as described in Fig. 3.

**Hind wings:**

Hind wings with anterior and posterior margin convex with apical margin slightly sinuated with apical angle rounded, veins  $Sc+R_1$  widely separated from  $Rs$ ,  $Rs$  originates from slightly beyond upper angle of cell,  $M_1$  originates from lower angle of cell,  $M_3$  originates from lower angle of cell, and parallel to  $Cu_1$ , three anal veins ( $A_1$ ,  $A_2$ ,  $A_3$ ) are present (Fig. 4).

**Male genitalia:**

Tegumen (Fig. 5) elongated covered with large hairs, saccus moderated U-shape, costa developed, produced in to three process, sacculus well developed produced into a sclerotised finger like process, uncus sclerotised bi-lobed, dorsal lobe with truncated apex, ventral lobe curved, sickle-shaped, besets with large hairs, gnathos semisclerotized, lobe-like, aedeagus (Fig. 6) tubular, with acute thecal appendage, membranous conjunctiva large beset with a group of spines and tridentate process at basal end.

**Female genitalia:**

Papillae anales somewhat triangular in shape, besets with large number of scales, apophysis posterior rod-like dilated at base, longer than curved apophysis anterior. Ductus bursae short, corpus bursae large proximally bi-lobed, ventral lobe short with a plate-like cornuti, dorsal lobe large and spherical, as shown in Fig. 7.

**Material examined:**

Four males and three females, Pakistan Karachi on light, 14.06.2005, leg. Shaheen Naz, Lodged at Kamaluddin's collection.



Fig. 1. Entire specimen *Achaea janata*.

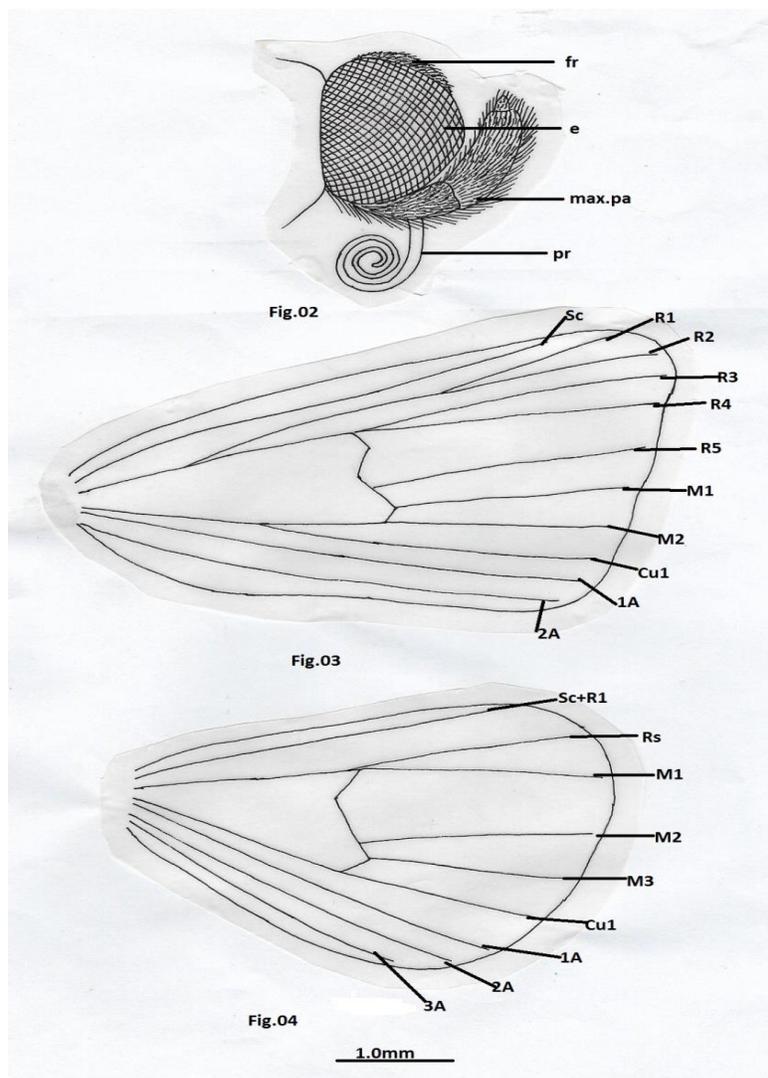


Fig. 2-4. Head, Fore-wing and Hind-wing of *Achaea janata*.

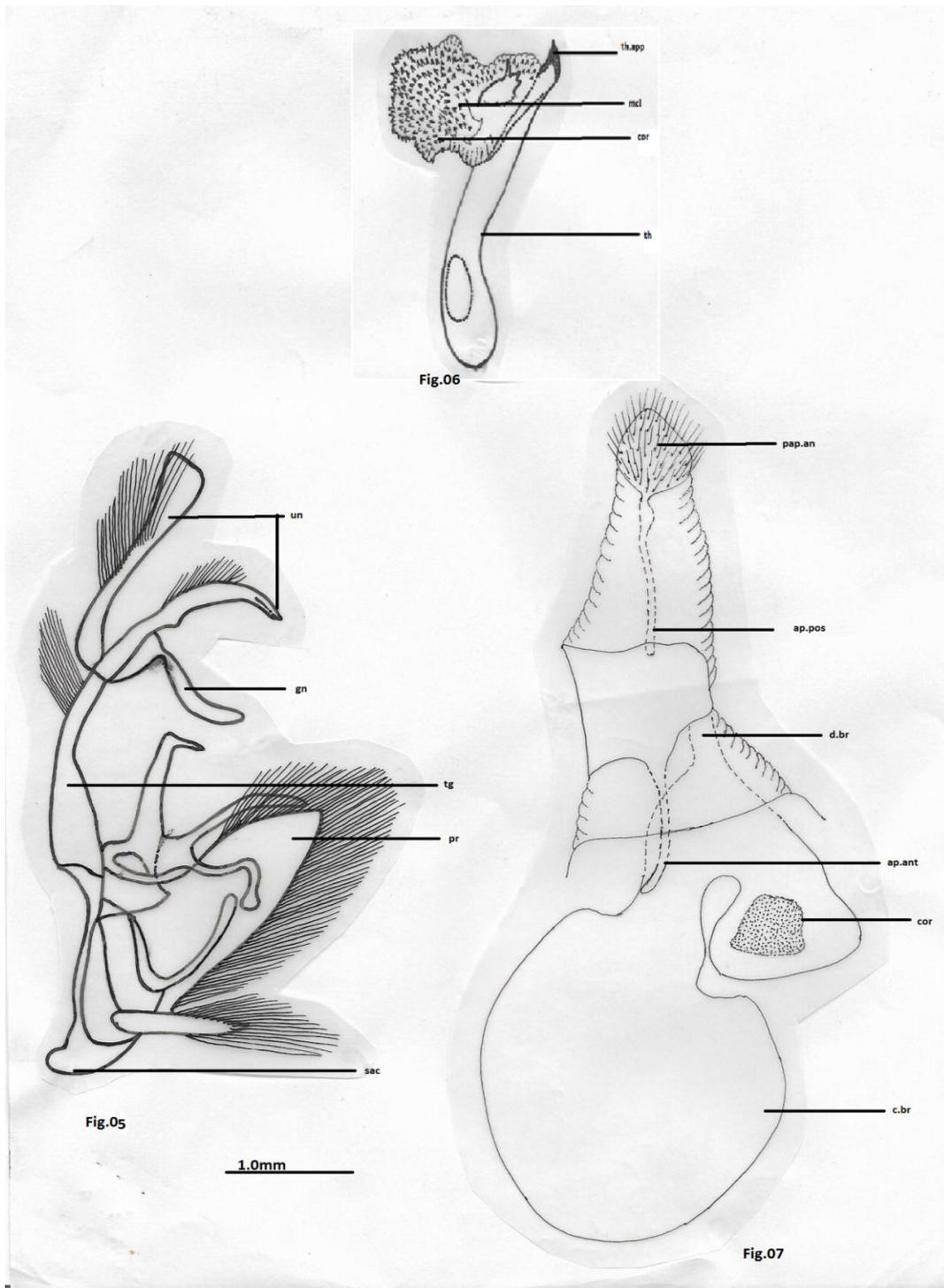


Fig. 5-7. Male and Female genitalia of *Achaea janata*.

Figs. 1 – 7. *Achaea janata* Hubner1. Entire, Dorsal view; 2. Head, lateral view; 3. Fore wing, dorsal view; 4. Hind wing, dorsal view; 5. Tegumen, lateral view; 6. Aedeagus, lateral view; 07; Female genitalia, lateral view.

**Key to the letterings:**

aed. (aedeagus), crt (cornuti), mcl (membranous conjunctival lobe), th (theca), e. (eye), fr. (frons), gn. (gnathos), jxt. (Juxta), max.p. (Maxillary palp), pr.(proboscis), prm (paramere), sac. (saccus), teg. (tegumen), unc. (Uncus), A1- A3. (First to third anal veins), Cu<sub>1</sub> (cubitus vein), M<sub>1</sub>- M<sub>3</sub>. (Median vein first to third), R<sub>1</sub>-R<sub>5</sub> (radius vein first to fifth), Rs. (radio-suctorial vein), Sc. (sub-costal vein).

**Comparative note:**

The genus *Achaea* Hubner comprises of *A. argilla* (Swinhoe), *A. serva* (Fabricius), *A. eusciasta* (Hampson) and *A. mercatoria* (Fabricius) from worldwide, although only one species *janata* (L.), recorded from Karachi, Pakistan. This species is closely related with *A. serva* in having general coloration, like noticeable pale-band on the hind-wing as compared to *janata* (Linnaeus) and does not have a dominant darker patch subternally on the underside. The forewing underside is more diffusely marked and less strongly variegated.

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