

***CLANIDOPSIS EXAUSTA* (BUTLER) (LEPIDOPTERA: SPHINGIDAE) FIRST TIME DESCRIBED FROM PAKISTAN**

MUHAMMAD FAHEEM YOUNUS¹ AND SYED KAMALUDDIN²

1) *Siraj Ud Dullah Government College No. 1, Karachi*

2) *Federal Urdu University of Arts, Sciences and Technology, Gulshan-e-Iqbal Campus, Karachi*

Abstract

Clanidopsis exausta (Butler) of the family Sphingidae first time redescribed from Pakistan with reference to its head components, venations of fore and hind wings and male genital component. The systematic position is also discussed with its apomorphies under the family Sphingidae.

Introduction

The species *Clanidopsis exausta* (Butler) is a monotypic and distributed in Oriental region. Presently this species is recorded from Northern areas of Pakistan. Cotes & Swinhoe (1887) mentioned this species under the genus *Clanis* (Hübner) from Kunawar, Kashmir and Simla. Hampson (1892) in his fauna of British India including Ceylon and Burma described genus *Clanidopsis* as *Ambulyx* Westwood with its brief description. Rothschild and Jordan (1903) revised and mentioned *Clanidopsis exausta* with brief description. Bell and Scott (1937) described in their fauna of British India including Ceylon and Burma, *Clanidopsis exausta* with reference to its external morphological characters of imago, larvae and pupae. . Kamaluddin *et al.* (2007) in their checklist of moths of Pakistan not mentioned *clanidopsis exausta*. Pittaway and Kitching (2000-2014) recorded this species from Oriental and Palaearctic regions. Rafi *et al.* (2014) in their report the hawkmoth fauna of Pakistan mentioned *Clanidopsis exausta* with only their distributional ranges.

Materials and Methods

The specimens were collected from various localities of Pakistan and Azad Kashmir and identified with the help of literature at hand which were also confirmed by Kitching, research entomologist British Museum Natural History, London. The colour photo session were made and prepared the slides of fore and hind wings. The measurement of the body (wing expansion) were taken with the help of a micromillimeter slide and for the study of male and female genitalia. The routine procedure were adopted following Younus and Kamaluddin (2010, 2014).

Results

Genus: *Clanidopsis* Rothschild and Jordan

Clanidopsis, Roths. & Jord., 1903, *Revision of Sphingidae*: 294; 1907, *In Wytsman, Gen. Ins.* 57: 59; Jordan, 1911, *In Seitz's Macrolep. Faun. Pal.* 2: 242; Bell and Scott, 1937, *Faun. Brit. Ind.* 5: 206.

Diagnostic features: Body moderate, narrowed and slim, generally reddish brown with dark brown streaks on wings and abdomen, head with frons broadly rounded, anteriorly produced, palpi with 2nd segment much longer than basal segment, proboscis short, antennae thin, fore wings broad with apical angle sub-acute, anterior and posterior margin slightly sinuated, apical margin convex, hind wings about 2/3rd the length of fore wings, veins Rs and M₁ stalked and originating from upper angle of cell, two anal veins are present. Male with tegumen oblongated, saccus cup-shaped, uncus very large, bifurcated, gnathos short, paramere broad well developed, aedeagus with theca short, membranous conjunctiva well developed with lobed process.

Comparative note: This genus is most closely related to genus *Leucophlebia* Westwood in having fore wings with 9-veins, in males apex of paramere rounded without spine but it can easily be separated from the same in having fore wings with four irregular cross bands, in males uncus bilobed, membranous conjunctival lobe without cornuti and by the other characters as noted in the description.

Type species: *Clanidopsis exusta* (Butler).

Distribution: Oriental region.

***Clanidopsis exusta* (Butler) (Figs. 1-7)**

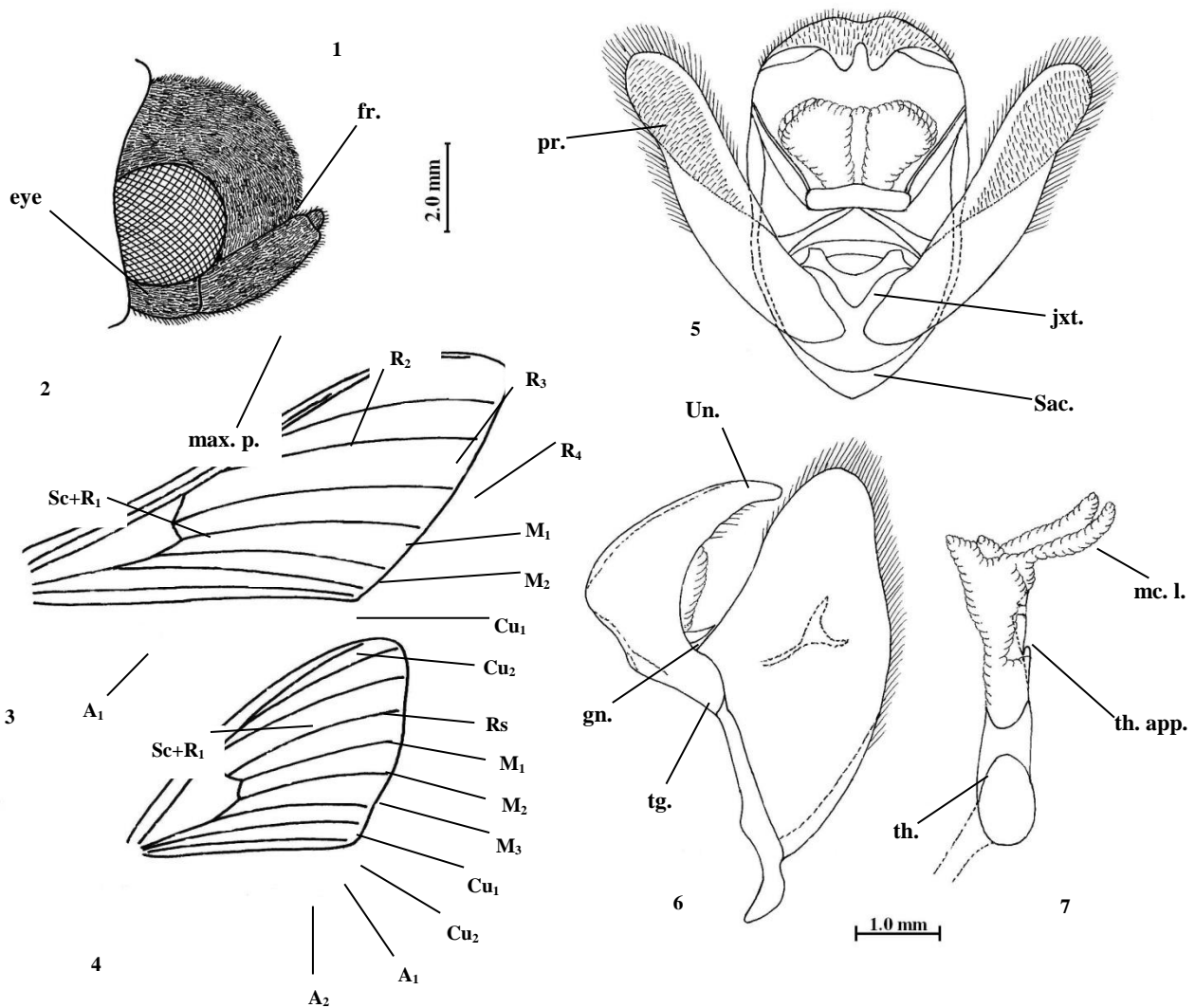
Basiana exusta, Butler, 1875, *Proc. Zool. Soc. Lond.*: 252; 1877A, *Trans. Zool. Soc. Lond.* 9: 595.

Clanis exusta, Butler, 1883, *Proc. Zool. Soc. Lond.*: 114

Ambulyx exusta, Hampson, 1892, *Faun. Brit. Ind. Moths*, 1: 80.



Clanidopsis exusta



Key to the letterings: e. (eye), fr. (frons), mx. p. (maxillary palpi), prb. (proboscis), Rs. (radio-suctorial vein), Sc. (sub-costal vein), Sc + R₁ (sub-costal and radius vein), Cu₁ and Cu₂ (cubital vein 1 and 2), A₁ and A₂ (anal vein 1 and 2), R₁-R₄ (radius vein 1 to 4), M₁-M₃(median vein 1 to 3), un. (uncus), gn. (gnathos), tg. (tegumen), pr. (paramere), Sac. (saccus), th. (theca), mc. l. (membranous conjunctival lobe). **Illustration of figures:** Figs. 1-7;

Clanidopsis exausta (Butler), 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.

Clanidopsis exusta, Roths. & Jord., 1903, *Revision of Sphingidae.*: 294; Jordan, 1911, *In Seitz's Macrolep. Faun. Pal. 2*: 242; Seitz's 1928, *In Seitz's Macrolep. 10*: 541; Bell and Scott, 1937, *Faun. Brit. Ind. Moths*, 5: 207.

Colouration: Body light brown, except dark brown pronotum, dorsum of abdomen, streaks on fore wings and hind wings.

Head (Fig. 2): Frons broadly rounded anteriorly produced, proboscis very short, palpi with basal segment short about 1/7th the second segment.

Fore wings (Fig. 3): Fore wings large about 1.5X the length of hind wings, apical margin slightly convex with apical angle sub-rounded, veins R₂ and R₃ stalked, later stalked with R₄ and originating from upper angle of cell, M₂ originates from lower angle of cell, only one anal vein (1A) present.

Hind wings (Fig. 4): Hind wings with anterior margin convex, posterior margin concave, apical margin sinuated with apical angle sub-rounded, veins Sc + R₁ stalked with R_s and originating from upper angle of cell, M₃ originates from lower angle of cell, two anal veins (1A and 2A) present.

Male genitalia (Figs. 5-7): Tegumen (Figs. 5 and 6) broad, oblongate, saccus cup-shaped with posterior margin acute without saccular process, uncus large broad, bifurcated with blunt apices, gnathos very short, thorn-like, membranous lobe short, paramere broad besets with hairs, a small bifurcated process at medio-inner margin, juxta V-shaped, aedeagus (Fig.7) with short theca and small thecal appendages, membranous lobe large with two small and two large horn-shaped lobes without cornuti.

Total length: Wing expansion 76–96 mm.

Material examined: Six males, Pakistan: Khyber Paktunkhwa; Nathia Gali, Donga gali, Azad Kashmir; Rawalakot, 12-05-2005, 13-04-2007, 17-06-2008 on light, leg. M. Faheem Younus and Zubair Ahmed, lodged at author's collection.

Comparative note: This species is monotypic species recorded from Oriental region and closely related to the *Clanis phalaris* (Cramer) in having general colour pattern but it can easily be separated from the same as well as the other species in having fore wings with R₂ and R₃ stalked, later stalked with R₄ and originating from upper angle of cell, uncus large broad, bifurcated with blunt apices, paramere with a small bifurcated process at medio-inner margin and by the other characters as noted in the description.

Discussion

Clanidopsis exausta (Butler) is a monotypic species and recorded from Oriental and Palaearctic regions, mostly from high altitude. In Pakistan, it is recorded from upper Punjab, KPK and Azad Kashmir.

The genus *Clanidopsis* Rothschild & Jordan plays sister group relationship with *Clanis* (Cramer) with their synapomorphies like hind wings with apical margin sinuated and paramere with one or without any process at inner margin and outgroup relationships by its autapomorphies like fore wings with four irregular cross bands, hind wings with veins Sc+R₁ largely stalked with R_s, in male uncus bilobed, aedeagus with a plate-like thecal appendage and the membranous conjunctival lobe with cornuti distally two small and two large horn-like lobes.

References

- Bell, T. R. D., and Scott, F. B. 1937. *The Fauna of British India including Ceylon and Burma, Moths Sphingidae 5*: 1–537.
- Cotes, E. C., and Swinhoe, C. 1887. *A Catalogue of the Moths of India*. Trustees of the Indian Museum, Calcutta, pt. i – Sphingidae: 1-40.
- Hampson, G. F. 1892. *The fauna of British India including Ceylon and Burma, Moths 1*: 65-123. Taylor and Francis.
- Kamaluddin, S., Viqar, S. N., Khan, K. A. B. S., and Ali, A., 2007. Checklist of Moths (Lepidoptera: Sphingidae) of Pakistan. *Int. J. Biol. Biotech.* 4 (2-3): 113-119.

- Pittaway, A.R. & Kitching, I.J. (2000-2015). *Sphingidae of the Eastern Palaearctic*. <http://tpittaway.tripod.com/china/china.htm>. [Site accessed: January 14, 2015]
- Rafi, M. A., Sultan, A., Kitching, I. J., Pittaway, A. R., Markhasiov, M., Khan, M. R. and Naz, F. 2014. The Hawkmoth Fauna of Pakistan (Lepidoptera: Sphingidae). *Zootaxa*, 3794 (3): 393-418.
- Rothschild, W. and Jordan, K. 1903. A revision of the lepidopterous family Sphingidae. *Novit. Zool.* 9, suppl.: 972 p., 57 pl.
- Younus, M. F. and Kamaluddin, S., 2010. Revision of the genus *Hippotion* Hubner (Lepidoptera:Sphingidae) with first time recorded species *Hippotion rosetta* from Pakistan. *Pak. J. entomol.* 25 (2): 117-122.
- Younus, M. F. and Kamaluddin, S., 2014. *Cephonodes hylas* (L.) (Lepidoptera:Sphingidae) first time described in detail with reference to its genitalia. *FUUAST J. BIOL.*, 4(1): 53-56.