

Redescription of *Chionaema perigrina* Walker (Lepidoptera: Arctiidae: Lithosiinae) from Pakistan and its Cladistic Relationship

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Abstract.- *Chionaema perigrina* Walker is redescribed in detail with special reference to its head appendages, venations of fore and hind wings and male and female genitalia. The systematic position and its cladistic relationship is also briefly discussed.

Key words: Redescription, *Chionaema perigrina* Walker, Arctiidae, Pakistan, cladistic relationship.

INTRODUCTION

Moore (1882) described two species under the genus *Bizone* Walker which were synonymised under the genus *Cyana* Walker, described by Hampson (1892) accommodating 22 species from Ethiopian, Australian and Oriental regions. Hampson (*op.cit.*) synonymised *Doliche* Walker 1854, *Bizone* Walker 1854 and *Chionaema* Herrich-Schaefer 1850 under the name *Cyana* Walker 1854, which showing that the name *Chionaema* has the priority and valid name. Cotes and Swinhoe (1887) listed only one species *Chionaema candida*, recorded from Himalayas.

Chaudhry (1966) and Chaudhry *et al.* (1970) listed four species *viz.* *Chionaema detrita*, *Chionaema buella*, *Chionaema quadrinolates* and *Chionaema* sp. from Huzara, Azad Kashmir Dhirkot, Abbottabad, Haripur and Khanpur in Pakistan. Watson *et al.* (1950) listed *Chionaema* in generic name of moths of the world. Hashmi and Tashfeen (1992) listed 16 species of the genus *Chionaema* in their Lepidoptera of Pakistan. Recently Kristenson (1999) discussed *Cyana hamala* under the sub-family Lithosiinae of the family Arctiidae ignoring the systematic status of the generic name

MATERIALS AND METHODS

The adult tiger moths, *Chionaema perigrina*

Walker, were collected with the help of light trap from Donga Gali, Ayubia, Pakistan and were identified with the help of Hampson (1894), and Moore (1882). For the study of 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.

Genus *Chionaema* Herrich-Schaeffer

Chionaema Herrich-Schaeffer 1850, *Samml. Aussereur. Schemett.* 1:21; Cotes and Swinhoe 1887, *Cat Moths Ind. Sphinges* 1: 115; Watson *et al.* 1980, *Br. Mus. (Nat. Hist.)* 2: 37; Hashmi and Tashfeen 1992, *Proc. ent. Soc.*, 12: 172.

Cyana Walker 1854, *Cat.* 2: 528; Hampson 1894, *Faun. Br. Ind.* 2:56

Doliche Walker 1854, *List Specimens Tepid Insects Cob, Br. Mus.* 2:529.

Bizone Walker 1854, *Ibid.*, 2: 548.

Diagnostic features

Body white with reddish patterned, eyes moderate, antennae ciliated, palpi slender and upturned, 2nd segment much longer than 3rd, fore wings large with apical margin almost straight, large

fringe present at upper distal half margin and posterior margin, hind wings broad, in males paramere bilobed, saccus without saccular process, theca with thecal appendage, membranous conjunctival lobe with spine-like cornuti, in female papillae anales large, apophyses short.

Comparative notes

This genus is most closely related to *Adrepsa* Moore in the absence of areole in fore wings but it can easily be separated from the same in having fore wings with vein 10 from the cell, palpi slender and upturned, antennae ciliated and by the other characters as noted in the description.

Types species

Chionaema detrita Walker.

Distribution

Ethiopian, Palaearctic and Oriental regions.

Chionaema perigrina Walker
(Figs. 1, 2)

Fig. 1. *Chionaema perigrina* Walker, entire, dorsal view.

Cyana perigrina, Walker, 1854, *Cat.* **2**: 55; Hampson 1894, *Faun. Br. Ind.* **2**: 56; Hashmi and Tashfeen 1992, *Proc. Pakistan Congr. Zool.*, **12**: 172.

Bizone quadrinotata, Walker, 1869, *Char. Underser. Ha*: 90.

Lithosia alborosea, Walker, 1864, *Cat.* **31**: 230.

Bizone puella, Butler, 1877, *Trans. ent. Soc. Lond.* 338.

Bizone puella, Moore, 1882-87, *Lep. Ceyl.* **2**: 103; Cotes and Swinhoe, 1887, *Cat. Moths. Ind.* **1**: 108.

Colouration

Body generally crimson and white, fore wings white with four vertical crimson striation, three black antemedial spots in males and one black antemedial spots in females, hind wings light crimson with dark margins, anterior and posterior margins of pronotum crimson.

Head

Eyes large, frons broad, palpi anteriorly pored, 2nd segment largest, 3rd segment about ½ of the length of 2nd, proboscis very long, coiled, antennae minutely ciliated in both sexes (Fig. 2A).

Fore wings

Fore wings (Fig. 2B) elongated, apical angle broadly rounded, vein R₁ originates from below upper angle of cell, veins R₂ and R₃ largely stalked, anastomosing with R₄ and originate from upper angle of cell, vein R₄ absent, veins M₁ and M₂ largely stalked and originate from lower angle of cell, M₃ originates just below lower angle of cell, two anal veins (1A and 2A) are present.

Hind wings

Hind wings (Fig. 2C) broad, with apical angle sub-rounded veins R_s and M₁ moderately stalked and originate from above upper angle of cell, M₂ and M₃ largely stalked and originated from lower angle of cell, three anal veins 1A to 3A present. The body size with wing expansion of male is 33 mm, while female is 35 mm.

Male genitalia

Tegumen (Figs. 2D and 2F) elongated, narrow, saccus broad, cup-shaped, without saccular process, uncus beak-shaped with acute apex beset with hairs on dorsal margin, gnathos large membranous, paramere large bilobed, inner lobe broad with apex rounded, beset with hairs, outer lobe narrowed with acutely curved apex, aedeagus (Fig. 2F) broad, lateral margin sinuated, with one dorsal and one ventral small thecal appendages, membranous conjunctival lobe with large number of dot-like and numerous spine-like cornuti.

Female genitalia

Papillae anales large, somewhat spherical, beset

Fig. 2. *Chionaema perigrina* Walker; A, head, lateral view; B, fore wing, dorsal view; C, hind wing, dorsal view; D, tegumen, ventral view; E, same, lateral view; E, aedeagus, lateral view; F, female genitalia, lateral view.

e. (eye), f. (frons), mx.p. (maxillary palp), prb. (proboscis), IA-3A.(anal veins 1 to 3), CuI-Cu2 (cubital veins 1 and 2), MI-M3(median veins 1 to 3), RI-R5 (radius veins 1 to 5), Rs. (radio-suctorial vein), Sc. (sub-costal vein), gn. (gnathos), pr. (parameter) sac.(saccus), un (uncus), mc.app. (membranous conjunctival appendage), th. (theca), th.app. (thecal appendage), ap.ant. (apophysis anterior), ap.post. (apophysis posterior), cbr. (corpus bursae) dbr. (ductus bursae), int.sgm. (inter segmental membrane), I.vg. (lobus vaginalis).

with thick hairs, apophysis posteriors thorn-like longer than apophysis anteriors, lobus vaginalis reduced, ductus bursae tube-like, corpus bursae bag-like, with proximal half sclerotized, distal half with a pair of cornuti (Fig. 2G).

Material examined

One male, 4 females, Pakistan, Ayubia, Donga Gali, Ghora Gali, 22.07.2002, on light, leg. Viqar Ahmad, Raja Rizwan, Nargis Viqar, lodged at Ali Museum of Insecta, Karachi.

Comparative notes

This species is most closely related to *puella* Drury in general appearance, fore wings with vein 6 absent in female, and hind wings with veins 6 and 7 originate from angle of cell but it can easily be separated from the same in having the costal margin of fore wings arched, fore wings of males with three black spots and females with one black spots and by the other characters as noted in the description

DISCUSSION

The genus *Chionaema* Herriach-Schaffer is distributed in African, Oriental and Australian regions. Most of the species are found at high altitude. Among these the species *perigrina* Walker is recorded from Ayubia, Ghora Gali and Donga Gali, Azad Kashmir, Hazara, Abbotabad and Khanpur in Pakistan and China, India, Ceylon, Burma, Nepal, Bangladesh and Sumatra.

Among 22 species, the *perigrina* Walker is closely allied to *puella* Drury in having general body shape and colour patterns but this species by having palpi very large, pored upward, in males paramere bilobed with outer lobe narrowed having beak-shaped apex, uncus blade-like, gnathos membranous, aedeagus with membranous conjunctiva beset with a bunch of thorn-like cornuti, in females the papillae anales semi-circular and corpus bursae with 2-cornuti show its autapomorphic characters.

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