REDESCRIPTION OF *CALLIMORPHA PRINCIPALIS* (KOLLAR) LEPIDOPTERA: ARCTIIDAE FROM PAKISTAN

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Abstract

The *Calliomorpha principalis* (Kollar) is redescribed in detail with special reference to its head, venation of fore and hind wings and male and female genitalia from Donga Gali, Ayubia, Pakistan.

Introduction

Walker (1855) on the basis of morphological characters described first time *Callimorpha principalis* as *Hypercompa principalis* and placed the same species under the family Bombicidae. Kollar (1884) redescribed *Callimorpha principalis* as *Euperia principalis* and placed the same species under the family Bombicidae. Cotes and Swinhoe (1888) gave a check list of Indian moths and listed genus *Calimorpha* as *Euperia* alongwith species *principalis* under the family Arctiidae recorded from hill area of to-days Pakistan. Leech (1888) gave a brief description and color plates of *Callimorpha principalis* but identified it as *Hypercompa principalis* (kollar). Hampson (1894) described 17- genera including *Callimorpha* principalis under the sub-family Arctiinae in his fauna of British India including Ceylon and Burna. Chaudhry *et al.* (1970) recorded *Callimorpha principalis* Koller from Hazara Dongagali on 20th August, 1963 and Swat, Kalam on 8th September, 1964 at light. Hashmi and Tashfeen (1992) gave a check list of Lepidoptera of Pakistan and listed *Callimorpha principalis* under the subfamily Arctiidae of family Arctiidae. Kirti and Sodhi (2003) identified *Callimorpha principalis* as tiger moth recorded from Sikkim. Kamaluddin *et al.* (2007) gave a checklist of moths of Pakistan, listed genus *Callimorpha* along-with its species *principalis.*

Materials and Methods

The adult Tiger moth *Callimorpha principalis* (Kolar) were collected with the help of light trap from Donga gali, Ayubia, Pakistan and were indentified with the help of literature. For the study of male female genital complex the abdomen were 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 detailed examination and later individual element of the genitalia and the associated structure were removed as required and examined. Drawing was made by using ocular grid to the given scale.

Results

Genus: Callimorpha Letreille: *Callimorpha* Latreille, 1809, Gen. Crust.Ins. 4:220; Hampson 1894, Cat. Moths Ind. Bommbyces 2:125.
Carcinopyga Felder, 1875, Reis Nov:2.

Diagnostic Features: Body with brilliant patterns, palpi long and porected, in males antennae minutely ciliated, fore wings long and narrow, vein R_2 originates from before upper angle of cell, veins M_2 originates from lower angel of cell, hind tibiae with two pairs of spurs.

Types species: *Phalaena dominula L.*
Distribution: Palaearctic and Oriental regions.

Key to the species of genus *Callimorpha* Laterille.

1. Body large sized always more than 70mm in wing expansion……2
   ……Body comparatively smaller always less than 70mm in wing expansion……4
2. Head and abdomen paler crimson, fore wings fuscous, hind wings pure white ……*equitalis Kollar.*……Head and abdomen crimson, fore wings not as above, hind wings light crimson……..…….3

3. Palpi and frons black, hind wings without black streaks on veins...*plagiata* walker ……palpi with a black spot, hind wings with black spot, hind wings with black streaks on veins……. *principalis* kollar
4. Head, thorax and abdomen entirely orange, fore wihngs with an extra spot below the center of median nervule……*nyctemeraota* Moore
   ……Head, thorax and abdomen paler,grey sometimes abdomen orange with black patches, fore wings without extra spot below the center of median nervule……...5
5. Fore wings grey with black tinged, yellow band with waved edges at base, hind wings crimson, a black spot at apex of cell ……..…*lichenigera* Felder
   ……Fore wings metallic green with light pale or white spots except basal and costal spot, hind wings with ground white color…… *similes* Moore

Fig. 1

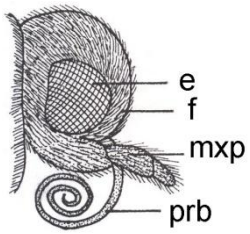

Fig. 2

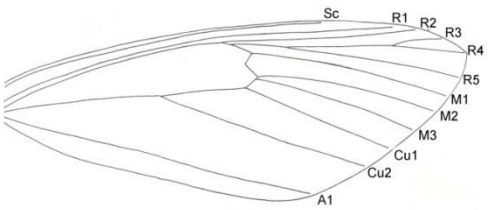

Fig. 3

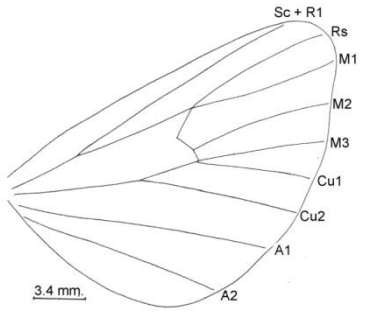

Fig. 4

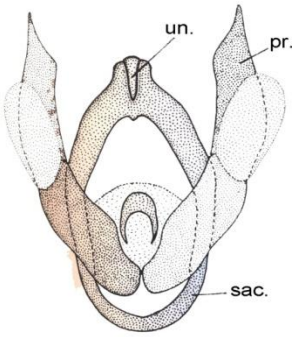

Fig. 5

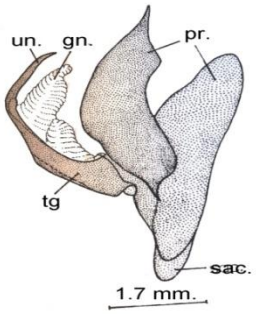

Fig. 6

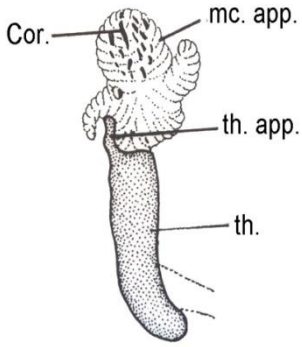

Fig. 7

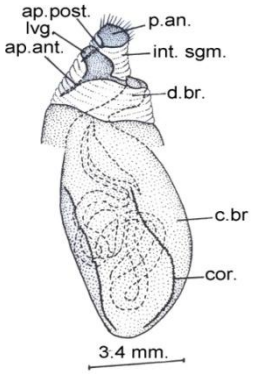

Fig. 8

Illustration of figure: Fig. 1, *Callimorpha princepalis* (Kollar); entire dorsal view. fig.2. head, lateral view; fig.3: fore wing, dorsal view; fig.4: hind wing, fig.5: tegumen, ventral view; fig.6: same, lateral view, fig.7: aedeagus, lateral view, fig.8: female genitalia, lateral view;

Key to the laterings: e: eye, f: frons, mx.p. macillary palpi, prb. proboscis, 1A-2A anal veins 1to 2, Cu1-Cu2: cubital veins 1 and 2, M_1 - M_3: median veins 1 to 3, R_1-R_5: radius veins 1 to 5, Rs: radio-suctorail vein, Sc: sub-coastal vein, gn: gnathos, pr, paramere, sac: saccus, un: uncus, mc-app: membranous conjuctival appendages, th: thecal appendage, ap.ant: apophysis anteriors, c.br: corpus bursae, d.br: ductus bursae, int.sgm: inter segmental membrane.

***Callimorpha principalis* (Kollar)** (Figs. 1-8)

Euperia principalis Kollar 1884, Hagel's Kashmis. 4:465
Hypercompa principalis Walker 1855, cat. Lep, cat. Moths Ind. Bombyces, 1:127
Callimorpha principalis Hampson 1894, Faun. Brit. Ind. 2:35; Chaudhry et al. 1970, Biol. Sci. Res. Div,2:176; Hashmi and Tasfeen, 1992, Proc. Pakistan Congr. Zool. 12:172.

Colouration: Head, thorax and abdomen are bright orange except black antennae, apical segment of palpi, frons, collar, lateral and medium longitudinal patches on thorax, a series of patches on abdomen (Fig.1)

Head: Eyes (Fig.2) moderate, frons rounded, palpi long prect with 2nd segment about the length of 3rd segment, proboscis long and coiled.

Fore Wings: Fore wings (Fig.3) large, apically narrowed metallic green with more than 20-patches of various sizes dully yellow, veins R_3 and R_4 largely stalked, further stalked with R_5 and originate from subapical angle of cell, M_2 and M_3 originate from lower angle of cell but not anastomosing, Cu_l and Cu_2 wide apart, only anal vein one (A_1) is present.

Hind Wings: Hind wings (Fig.4) small, about apex narrowed yellow with 4-sub-apical large black patches following black nervules, veins with Rs amd M_1 anastomosing at base and originate from upper angle of cell, M_2 originate above the posterior angle of cell, veins M_3 and Cu_1 not anastomosing but originate from lower angle of cell, two anal veins (A_1 and A_2) are present.

Male genitalia: Tegumen (Figs.5&6) oblongata, sclerotized, saccus semicircular with broad base, without process, uncus beak-shaped without process, uncus beak-shaped with outer and inner margin sinuated with supply pointed incurved apedx, gnahos large membranous with lobe-like apex; paramere large bilobed, ventral lobe with sub-rounded apices, dorsal lobe large with apices sharply toothed, beset with long; aedeagus (Fig.7) moderate sized, tubular with lateral thumb – like thecal lobe, membranous appendage trilobed, outer and inner lobe small, median lobe large, spherical with a large number of cornuti.

Female genitalia: Papillae anales small, somewhat rectangular with outer sinuated, apophysis posteriors small thorn – like slightly shorter than apophysis anteriors, lobus vaginalis somewhat rectangular shaped, ductus bursae broad, short, corpus bursae oblongate with two large, elongated thread-like cornuti (Fig.8).

Material Examined: Ten males, nine females examined, collected from Pakistan, Donga gali, Ayubia 2.8.2005, on light available in author's collection.

Discussion

This species is most closely related to *palgiata* walker in having fore wings with vein R_5 not directly originating from upper angle of cell, anastomosing with R_3 and R_4, in males tegument entire without dorsal lobe, gnathos very large about equal to the length uncus but it can easily, be separate from the same in having frons broadly convex, maxillary palpi anteroventrally directed, 2nd segment about or slightly less than 2x the length of 3rd, proboscis very long. Fore wings with veins R_5 and M_1 anastomising and originate from upper angle of cell, in males tegument oblonagte uncus gradually anrrowed, paramere bilobed, inner lobe large with problonged apex, theca with thumb-like thecal appendage, conjuntival appendage short bilobed and by the other characters as noted in the key and description.

This species is recorded from Donga gali Ghora gali in between the range of 2400m above sea level. The population is very high during July and August and very low in December and January. The temperature varies during summer 17°C and in winter 10°C while average annual temperature is 12°C. The amount of precipitation between 1300-1400mm or sometimes to about 1450mm. Average relative humidity at 1200 UTC 61%.

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