



A new species of the genus *Zamarada* Moore (Lepidoptera: Geometridae) from Shivaliks in Punjab, India

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Abbreviations: 1A - First anal vein; 2A - Second anal vein; 3A - Third anal vein; 1A+2A - Vein representing fused first and second anal vein; ASL - Above sea level; CuA1 - First cubital vein; CuA2 - Second cubital vein; CuP - Cubital posterior vein; M1 - First median vein; M2 - Second median vein; R1 - First radial vein; R2 - Second radial vein; R3 - Third radial vein; R4 - Fourth radial vein; R5 - Fifth radial vein; Rs - Radial sector; Sc - Subcostal vein; Sc+R1 - Stalk of subcostal and first radial vein.

Hampson (1895) redescribed the genus *Zamarada* Moore, with *Z. translucida* Moore as its type-species. Fletcher (1979) considered the latter species as a junior subjective synonym of *Euchloris baliata* Felder & Rogenhofer. Recently, Holloway (1993) revised the genus, and considered *Z. translucida* Moore and *Euchloris baliata* as synonyms of *Z. baliata* Felder & Rogenhofer. Six species i.e., *baliata*, *scriptifasciata*, *denticulata*, *nesiotica*, *ucatooides* and *eogenaria* have been included under *Zamarada* by Holloway. Out of these species, the latter has been reported from India. All these species have been distinguished on the basis of the female genitalia. The genitalia of the species described here were compared with the illustrations of these described species, and since the collected sample does not conform to any of them the unnamed species is reported as *Zamarada pseudobaliata* sp. nov. The types are deposited in the Lepidoptera Laboratory, Department of

Zoology, Punjabi University, Patiala, Punjab, India.

Zamarada pseudobaliata sp. nov.

(Figs. 1-5)

Material examined

Holotype: Male, 21.x.1999, Roopnagar, Roopnagar District, Punjab, 350m, coll. H.S. Rose & Rachita Sood (LL/DZ/PUP-GEO 01).

Paratypes: 9 males, 1 female, 23.x.2001, Dunera, Gurdaspur District, Punjab, 700m; 10 males, 8 females, 27.x.2001; 2 males, 23.viii.2002, Hoshiarpur, Hoshiarpur district, Punjab, 370m; 9 males, 23.x.2001, Dhar, Hoshiarpur district, Punjab, 650m, coll. H.S. Rose & Rachita Sood (LL/DZ/PUP-GEO 02-40).

Distribution

India: Punjab: Roopnagar, Dunera, Hoshiarpur, Dhar.

Etymology

The species name is proposed after the name of the closely allied species, *baliata*.

Male and Female

Alar expanse: Male 30mm; Female 32mm. Antennae bipectinate to two-third length in both sexes, branches longer in male than female; hind tibiae not dilated; wings hyaline yellowish-green, with a few dark striae, a small sub-basal patch, a broad marginal band purplish grey irrorated with fuscous, deeply indented between veins CuA2 and M3, a dark speck at the end of cell; forewing with veins R3 to R5, M2 from middle of cell; hindwing with veins Rs and M1 connate, arising from upper angle of cell, M2 and M3 connate.

Wing venation (Figs. 1 & 2): Forewing with Sc ending at 2/3rd of costa, R2+R3+R4 stalked, arising from upper angle of discal cell, R5 arising near the upper angle of discal cell, M1 absent, M2 arising from middle of cell, M3 and CuA1 arising from lower angle of discal cell, CuA2 from 2/3rd of cell, discal cell closed, CuP vestigial, visible at margin, 1A+2A forked at base; hindwing with Sc+R1 ending near apex, Rs and M1 arcing at the upper angle of discal cell, M2 and M3 from lower discal angle of cell, CuA1 not traceable, CuA2 arising near middle of discal cell, CuP absent, 1A+2A present, 3A absent.

Male genitalia (Figs. 3 & 4): Uncus broad at base, narrower towards apex as if forming a dome-like structure, beset with setae, the latter densely arranged; gnathos arms fused in the middle, heavily sclerotised, impregnated with small hooks-like markings on the fused portion; tegumen long, sclerotised, V-shaped, arms narrow towards the base of uncus; vinculum broadly U-shaped; coremata present; valvae narrower, costal region given off into flange like processes called ampulla, the latter adorned with setae on the apical end, apex pointed, sacculus region well developed furnished with long setae, sacculus well sclerotised, sharp from apical end; transtilla thin; aedeagus passes terminally, slender, thick pointing towards vesica armed with cornuti, cornuti well developed, spine-like.

Female genitalia (Fig. 5): Ovipositor lobes long, adorned with setae; posterior apophyses of double length than anterior apophyses; ostium bursae rounded; sterigma ornamented with dorsal lobe, divided into three spines, the lateral digitate processes, apically serrate, central of same length as that of

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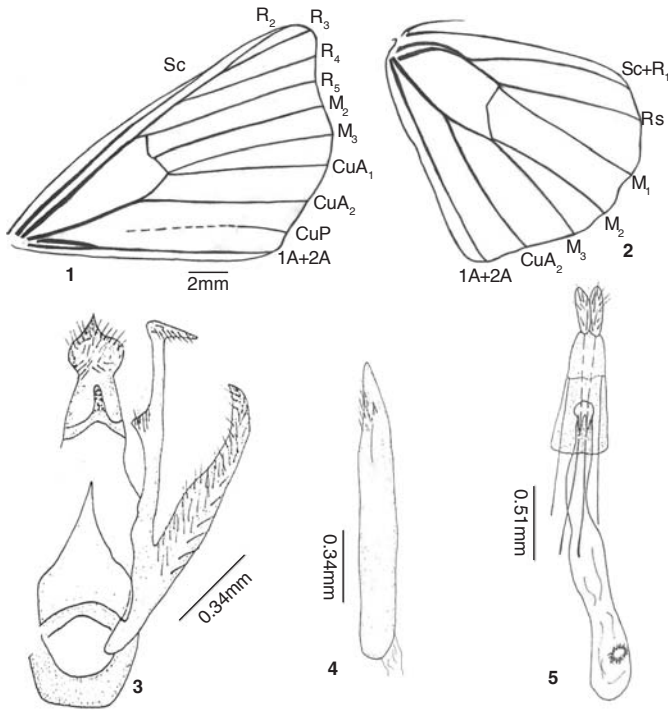
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Figures 1-5. *Zamarada pseudobaliata* sp. nov.
 1 - Forewing venation; 2 - Hindwing venation; 3 - Male genitalia ventral view; 4 - Aedeagus; 5 - Female genitalia ventral view

lateral spines but rounded anteriorly; ductus bursae striated internally; corpus bursae elongated, signum well defined; oval with uniformly arranged spines on the outer side.

Food plant: Not known.

Discussion

The critical examination of the genitalia reveals that though the species under reference is closely allied to *baliata* Felder & Rogenhofer, yet differs in the shape of the sterigma in the female genitalia, as in case of *baliata* Felder the sterigma is ornamented with a dorsal lobe in all three spines and lateral digitate processes that are apically serrate in the first two. But in case of *pseudobaliata* sp. nov., the lateral digitate process are apically serrate in all the three and the central spine is of same length but rounded anterior, which is not the case in *baliata* Felder. Besides this, the male genitalia of *baliata* have an excavate area to the sacculus region of the valva and the costal region is not given off to a flange like process, which is adorned with setae in *pseudobaliata* sp. nov., and saccular region is also not so excavate and is sharp apically.

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