

TAXONOMIC STUDIES ON TWO INDIAN SPECIES OF GENUS *CHRYSORABDIA* BUTLER (LITHOSIINAE: ARCTIIDAE: LEPIDOPTERA)

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Abstract

The morphological characters of the external genitalia of two Indian species viz. *Chrysozabdia viridata* and *Chrysozabdia bivitta* have been studied and illustrated. A revised diagnosis of the genus along with a key to these species is given. The paper also indicates a range extension for the two species.

Key words

Chrysozabdia viridata, *C. bivitta*, *revision*, *redescription*, *genitalia*, *range extension*

Abbreviations

AED - Aedeagus

CO - Costa

CRP.BU - Corpus bursae

CU - Cucullus

DU.EJ - Ductus ejaculatoris

JX - Juxta

PAP.A - Papilla analis

R - Radial vein

Sc+R - Subcosta and radial vein

SL - Sacculus

TRA - Transtilla

VIN - Vinculum

ANT. APO - Anterior apophyses

CRN - Cornuti

Cu - Cubital Vein

DU.BU - Ductus bursae

G.P. - Genital plate

M - Medial vein

PO.APO - Posterior apophyses

SA - Saccus

SIG - Signum

TG - Tegumen

UN - Uncus

VLA - Valvula

Introduction

In surveys conducted in different localities of northern and northeastern India for the collection of footman moths, 17 adult representatives of two species of the genus *Chrysozabdia* Butler have been collected. They were subsequently identified as *C. viridata* Walker and *C. bivitta* Walker by reference to literature (Hampson, 1894; 1900) and material available with collections of Forest Research Institute, Dehradun and Zoological Survey of India, Calcutta. These two species are the sole representatives of this genus in India.

The taxonomically important features such as labial palpi, wing venation and maculation in these two species have been studied.

Besides, male and female genitalic characters were also studied and illustrated and included in the genus diagnosis. The terminology for naming various genitalic parts has been followed after Klots (1970). The critical study of these taxonomic features revealed that both these species are congeneric.

Genus *Chrysozabdia* Butler

Butler, 1877, Trans. Ent. Soc. 1877: 357

Type Species: *Chrysozabdia viridata* Walker

Distribution: Northwestern Himalaya, Assam, Sikkim, Tibet and Myanmar.

Diagnosis

Labial palpus slightly upturned. Antenna simple, ciliated. Forewing long and narrow; veins R_2 and R_5 originating from

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aerole, formed by anastomosis of R_3 and R_4 ; M_1 from upper angle of cell; M_2 absent; M_3 from lower angle of cell; Cu_1 from before lower angle of cell; Cu_2 from near middle of cell. Hindwing with discoidal cell open; M_2 absent; vein $Sc+R_1$ originating from near middle of cell. Abdomen clothed with rough hair. Male genitalia with uncus of moderate length; tegumen shorter than vinculum; saccus reduced; valva with valvula strongly sclerotized, curved, with pointed or blunt tip; cucullus broad; juxta large. Female genitalia with corpus bursae small, balloon shaped, membranous; circular signum present; ductus bursae quite long, of equal width, lower part guarded with well sclerotized genital plate; anterior apophyses slightly shorter than posterior apophyses.

Chrysorabdia viridata (Walker)

(Figs. 1-5)

Lithosia viridata Wlk., 1861, Cat. Lep. Het. 31:225; Moore, 1872, P.Z.S. 1872: 12; Hmps., 1893 Moths Ind. 2:74; id., 1900 Cat. Lep. Phal.2: 183; Kirby, 1892, Cat. Het. 1: 337

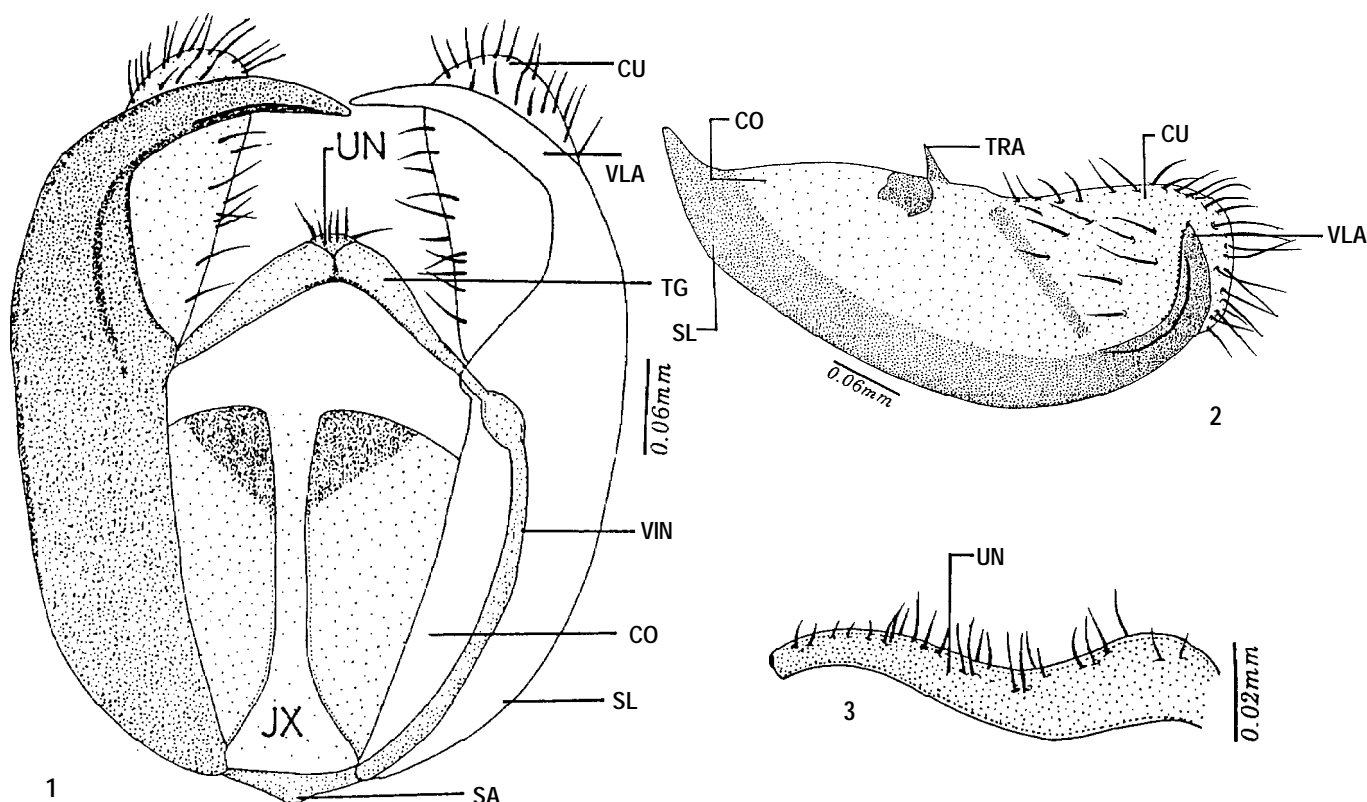
Material examined: Five males and one female, 11.ix.94, Bomdila (2700 m.), West Kameng District, Arunachal Pradesh; One male and two females, 12.ix.94, Dirang (1497 m.),

Arunachal Pradesh; One male, 13.v.95, Lachen (3300 m.), Sikkim; One male, 29.iv.95, Kurseong (2200 m.), West Bengal; One male, 2.v.95, Sukia, Ghoom (2100 m.), West Bengal; One male, 1.v.95, Lopchu (1900 m.), West Bengal.

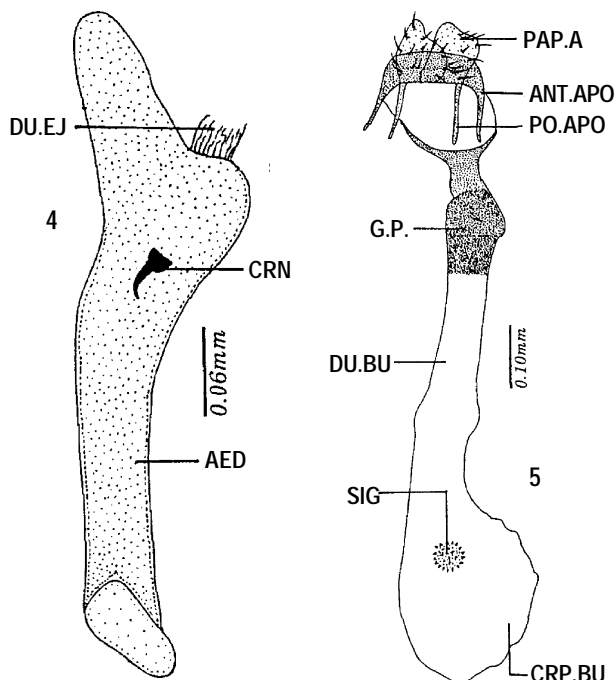
Old distribution: Sikkim, Assam; Silhet.

Male genitalia: Uncus small, sickle-shaped, with a blunt tip, knob-like sclerotization on distal end, dorsally setose, long setae in middle; tegumen broad, triangular, shorter than vinculum; vinculum long and narrow, V-shaped; saccus short and reduced. Valva foot-like with sacculus and costa ill-defined; valvula strongly sclerotized, dentate, curved, with its tip triangular cucullus broad, with a sclerotized projection in its basal half; juxta cerviculate; transtilla membranous. Aedeagus broad and round at anterior end, narrow towards middle; anterior tip produced upward and rounded; vesica armed with a strong sclerotized spine anteriorly.

Female genitalia: Corpus bursae membranous, balloon-like; serrated signum present; ductus bursae quite long, almost of equal width, membranous; ostium bursae surrounded by a strongly sclerotized genital plate; anterior apophyses with their apices narrow; papilla analis broad and rounded, setose with fine setae.



Figures 1-3. *Chrysorabdia viridata* (Walker)
1. Male genitalia; 2. Valva (left - inner view); 3. Uncus (lateral view)



Figures 4-5. *Chrysorabdia viridata* (Walker)
4. Aedeagus; 5. Female genitalia

Wing Expanse (Half): Male: 21 mm.; Female: 21-25 mm.

***Chrysorabdia bivitta* (Walker)**

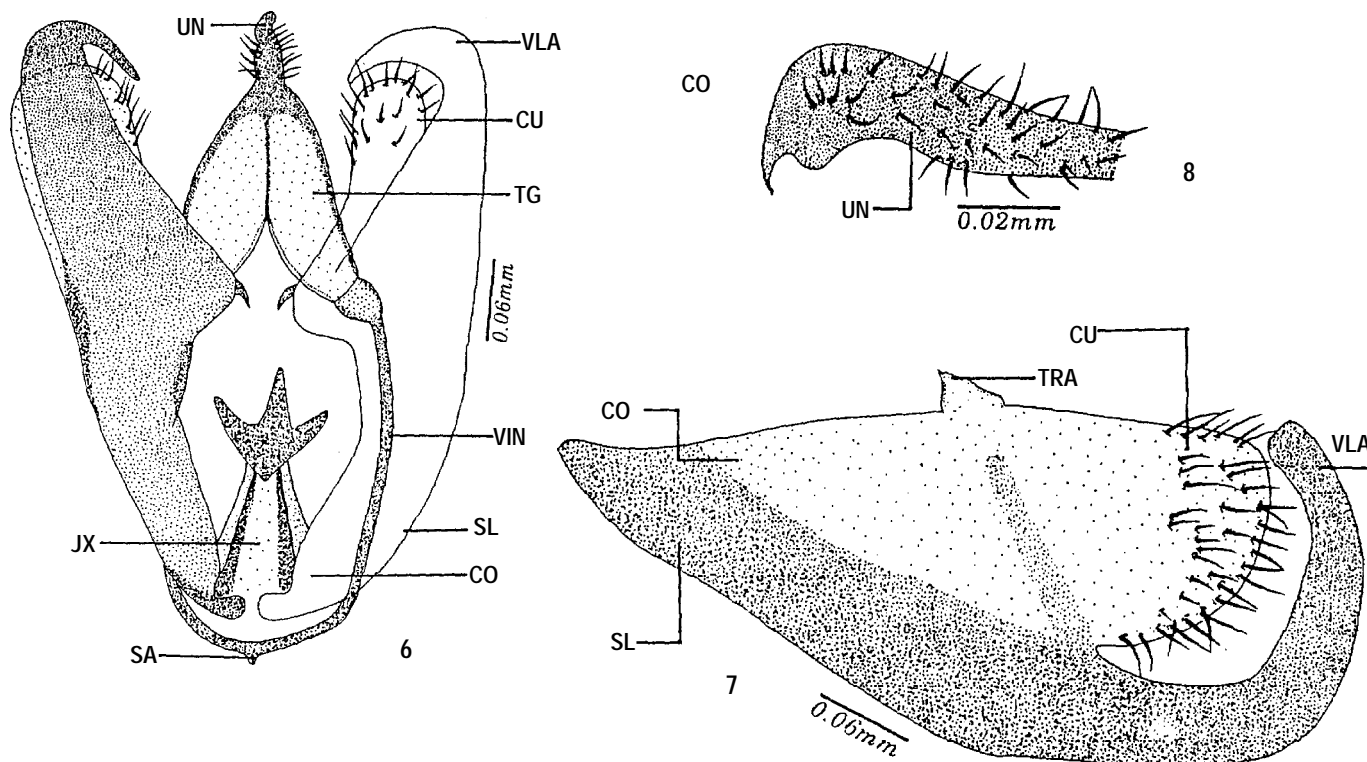
(Figs. 6-11)

Lithosia bivitta Wlk., 1856, Cat. Lep. Het. 7:1682; Hmps., 1894, Moths Ind. 2:74; id. 1900 Cat. Lep. Phal.2:183; Kirby, 1892, Cat. Het. 1:337, *Lithosia disjuncta* Moore, 1865, P.Z.S. 1865: 97.

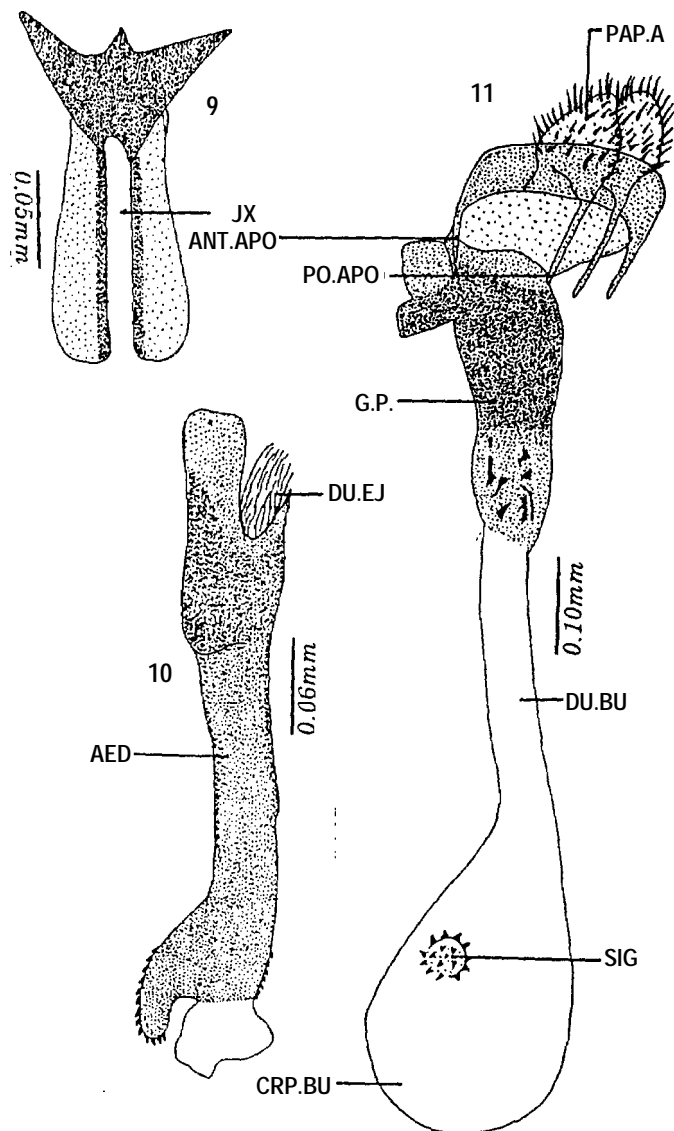
Material examined: One male, 19.vi.93, Bhanjuradu (1570 m.), Himachal Pradesh; One male, 1.vii.95, Kalpa (2950 m.), Himachal Pradesh; One male, 10.vi.95, Loharkhet (1760 m.), Uttar Pradesh; One male, 8.ix.95, U.T. Chandigarh (353 m.).

Old distribution: N.W. Himalayas, Sikkim, Manipur; Myanmar.

Male genitalia: Uncus well developed, narrow from base to middle, gradually broad and rounded towards tip, with lower wall produced inwardly, tip bearing a pointed spine-like projection; tegumen broad and triangular for almost half length of vinculum; vinculum long, U-shaped; saccus reduced, outwardly produced into a sclerotized small knob-like projection. Valva with sacculus and costa well defined; valvula curved,



Figures 6-8. *Chrysorabdia bivitta* (Walker)
6. Male genitalia; 7. Valva (left - inner view); 8. Uncus (lateral view)



Figures 9-11. *Chryсорabdia bivitta* (Walker)
 9. Juxta (enlarged); 10. Aedeagus; 11. Female genitalia

strongly sclerotized, reaching above cucullus, a sclerotized patch near base; cucullus heavily setosed and broad; juxta large with both of its parallel arms highly sclerotized and attached to a triangular projection in middle; transtilla triangular. Aedeagus strongly sclerotized, long and narrow, with a V-shaped projection at anterior end, a rounded spined projection at distal end; vesica without any cornuti.

Female genitalia: Corpus bursae balloon-like, membranous; a moon-shaped signum present; ductus bursae very long, membranous, lower part surrounded by a highly sclerotized genital plate; both pair of apophyses sclerotized, with their blunt tips; papilla analis broad and rounded, fringed with small and fine setae.

Wing expanse (Half): Male: 27 mm; Female: 34 mm.

Acknowledgements

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Key to the species of genus *Chryсорabdia* Butler

1. Thorax clothed with black scales; forewing with medial fascia continuous; vein Cu₁ arising from well before middle of cell; Cu₂ from before middle of cell; male genitalia with uncus sickle-shaped, with blunt tip; valvula narrowing gradually towards narrow tip, inner margin dentate towards apical portion; aedeagus with anterior tip rounded, no thumb like projection at distal end, single cornutus present *viridata* (Walker).

Thorax clothed with yellow scales. Forewing with medial fascia interrupted in male; vein Cu₁ arising from just before angle of cell; Cu₂ from just beyond middle of cell; male genitalia with uncus gradually broad and rounded towards sharp pointed tip; valvula not narrowing towards blunt tip, apical portion highly sclerotized; aedeagus with anterior tip not rounded; a thumb-like projection at distal end, with its walls dentate, no cornuti present *bivitta* (Walker).