

Description of four new species of the genus *Lyclene* MOORE (Lepidoptera: Arctiidae: Lithosiinae) from India

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Abstract. Four new species of *Lyclene* MOORE, *L. kishidai* sp.n., *L. uncalis* sp.n., *L. hollowai* sp.n., and *L. goaensis* sp.n. are described from India.

Key words: Lepidoptera, Arctiidae, Lithosiinae, *Lyclene*, new species, India.

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I. INTRODUCTION

The genus *Lyclene* was proposed by MOORE (1859) as the objective replacement name for *Cyllene* WALKER (1854). The type species of *Lyclene* is *Cyllene humilis* WALKER, 1854 collected in Burma. HAMPSON (1894) synonymized genus *Lyclene* with *Miltochrista* HÜBNER. In 1900, HAMPSON transferred this genus to *Asura* WALKER as a separate section. STRAND (1922) followed the same nomenclature. ARORA and CHAUDHARY (1982) studied the lepidopterous fauna of Arunachal Pradesh and adjoining areas and stated that two genera i.e. *Asura* WALKER and *Miltochrista* HÜBNER are known from India by 42 and 27 species respectively. NIELSEN *et al.*, (1996) revived genus *Lyclene* MOORE with broader concept and included different species which were previously described in *Asura* WALKER and *Miltochrista* HÜBNER. HOLLOWAY (2001) partially followed NIELSEN *et al.* (*loc.cit*) and resurrected the genera *Adites* MOORE and *Barsine* WALKER from the synonymy of *Lyclene* and suggested a stable status for the latter. According to him, the yellow ground colour, an aedeagus vesica with a small number (one or two) of large cornuti, valvae with distal costal and saccular processes are the diagnostic attributes of genus *Lyclene* MOORE. The new species studied here belong to a homogeneous group and conform to the characterization of *Lyclene* MOORE and are natural allies of the type species *humilis* WALKER. It is worth mentioning that in one of the studied species i.e. *L. kishidai* two patches of spines are present in vesica instead of one or two large cornuti. But the authors are of the view that it is not feasible to shift this species under any other genus on the basis of this single attribute. Hence, it has been retained under *Lyclene* MOORE. These species could not be identified from the relevant literature and by comparison with the collec-

tions housed in the national museums and Natural History Museum, London. The detailed description of four new species is given in this communication.

II. MATERIAL AND METHODS

The examined material has been collected at light traps in different localities of Western Ghats of India. The method proposed by COMMON (1970) and advocated by ZIMMERMAN (1978) has been applied for the preparation of permanent slides of fore and hindwings. For the study of external male genitalia, methodology given by ROBINSON (1976) has been followed, for naming these structures terminology given by KLOTS (1970) has been used.

III. TAXONOMY

Genus *Lyclene* MOORE

MOORE, 1859, *Cat. Lep. Ins. Mus. nat. Hist.*, 2: 300.

Type species: *Cyllene humilis* WALKER.

D i s t r i b u t i o n. Palearctic, Ethiopian, Oriental and Australian regions.

D i a g n o s i s. Labial palpi porrect or correctly downward. Antennae bipectinate with branches short or ciliated in males, simple in females. Forewing with vein R_1 anastomoses with Sc and separates to meet costa or running close to Sc; R_2 before upper angle of cell; R_3 , R_4 and R_5 stalked; M_1 from upper angle or stalked with R_3 , R_4 and R_5 ; M_2 beyond or from lower angle of cell; M_3 from or near lower angle of cell. Hindwing with vein Sc+ R_1 originating towards angle of cell; Rs and M_1 on a long stalk; M_2 on a short stalk with M_3 or from the same point or beyond lower angle. Male genitalia with uncus long and curved; acrotergite absent; fenestrula present; saccus developed; valvae with tip bifurcated, cucullus and valvula well differentiated; aedeagus with vesica provided with small number (one or two) of large cornuti or with two patches of minute spines (in *kishidai*); ductus ejaculatorius entering apically or subapically. Female genitalia with corpus bursae of different shapes, containing at least moderate to long spines, amid more general scrobination; ductus bursae short or moderately long.

Lyclene kishidai sp.n.

(Figs 1-9)

M a t e r i a l e x a m i n e d. Holotype. ♂ India: Kerala, Vadasserikkara, 30 m, 7.IX.04 (Coll.N.S. GILL).

Deposited in the Zoology Museum, Department of Zoology, Punjabi University, Patiala.

Paratypes. 1 ♂, 2 ♀ India: Kerala, Chendruni, 70 m, 3.IX.04, 2 ♀; Vithura, 120 m, 4.IX.04, 1 ♂.

D i a g n o s i s. Head with frons and vertex ochreous. Antennae ciliated in male, simple in female; scape, pedicel and shaft brown, suffused with yellow scales. Eyes black with pale linings. Labial palpi porrect, reaching slightly beyond frons; covered with ochreous scales; third segment short.

Thorax and tegula ochreous, spotted with black; collar and pectus orange yellow. Forewing with ground colour ochreous; two subbasal spots; four antemedial spots; black band beyond series of antemedial black spots; highly dentate postmedial band; submarginal series of black spots; underside same with markings obsolete; fringe yellow; vein R_1 not anastomoses with Sc; R_2 from cell; R_3 , R_4 and R_5 stalked; M_1 from upper angle; M_2 from lower angle; M_3 near angle of cell; Cu_1 before angle of cell; Cu_2 from middle of cell. Hindwing with ground colour ochreous; underside and fringe same; vein Sc+ R_1 originating from middle of cell; Rs and M_1 on a long stalk; M_2 towards middle of discocellulars; M_3 and Cu_1 from lower angle; Cu_2 from middle of cell. Legs ochreous, suffused with fuscous scales; hind tibia with two pair of spurs. Abdomen orange yellow.

Male genitalia. Uncus sickle shaped, long and broad, setosed with scattered setae, sclerotized, slightly curved towards distal end, frequently ending to a pointed tip; acrotergite absent; fenestrula small spot like; tegumen longer than uncus, v-shaped; vinculum longer than tegumen, u-shaped, weakly sclerotized; saccus present. Valvae with costa narrow and linear; sacculus setosed with small setae, proximal region strongly sclerotized, saccular process present; ampulla present; cucullus membranous, covered with short setae; valvula ending to a horn like structure. Transtilla membranous; juxta small, triangular; aedeagus strongly built, short and broad; vesica membranous, two patches of spines present; ductus ejaculatorius entering apically.

Female genitalia. Corpus bursae triangular, opaque, posterior region more sclerotized, signum not distinct; ductus bursae short and moderately narrow, weakly sclerotized; ductus seminalis entering corpus bursae; anterior apophyses longer than posterior apophyses; papilla analis setosed with short setae.

Wingspan. Male 30 mm; female 36 mm.

R e m a r k s. *Lyclene kishidai* is closely allied to *Miltochrista ocellata* HAMPSON, 1907 on the basis of general maculation. However, the markings on forewing of the new species are very prominent and presence of subbasal series of four spots on the forewing clearly separate it from *ocellata* HAMPSON.

E t y m o l o g y. The name of the new species is dedicated to an eminent scientist YASUNORI KISHIDA from Japan, working on family Arctiidae.

***Lyclene uncalis* sp.n.**

(Figs 10-18)

Material examined. Holotype. ♂ India: Karnataka, Medikeri, 1100 m, 25.IX.03, (Coll. N.S. GILL)

Deposited in the Zoology Museum, Department of Zoology, Punjabi University, Patiala.

Paratypes. 10♂♂, 2♀♀. India: Karnataka, Bhagamandala, 900 m, 15.VII.04 – 1♀, 31.VII.04 – 1♂. Tamil Nadu, Gudalur, 900 m, 28.IX.03 – 1♂, 15.XI.05 – 4♂♂, 16.XI.05 – 1♂. Kerala, Vallakadava, 780 m, 9.IX.04 – 2♀♀ 1♀; Muccali, 560 m, 20.IX.05 – 1♂.

D i a g n o s i s. Head with frons and vertex ochreous. Antennae ciliated in male, simple in female; scape, pedicel and shaft covered with ochreous scales. Eyes fuscous green, spotted with black. Labial palpi porrect, not reaching frons; covered with ochreous scales, with fuscous suffusion.

Thorax, collar and tegula yellowish rufus, thorax and tegula spotted with black; pectus orange yellow. Forewing with ground colour reddish orange; base of costa black; a basal black spot; submarginal band; broad medial black band, bifurcated towards costa; marginal series of fuscous spots; underside same with markings obsolete; fringe ochreous; vein R_1 anastomoses with Sc; R_2 from cell; R_3 , R_4 and R_5 from a common stalk; M_1 from upper angle of cell; M_2 and M_3 from lower angle; Cu_1 and Cu_2 from cell. Hindwing with ground colour yellowish orange, irrorated with pink scales; a medial diffused band; black spot at apex; underside same; fringe yellowish orange; vein Sc+ R_1 originating near upper angle of cell; R_s and M_1 on a long stalk; M_2 and M_3 from lower angle; Cu_1 and Cu_2 from cell. Legs covered with ochreous scales; hind tibia with two pair of spurs. Abdomen covered with brown scales; underside and tuft orange yellow.

Male genitalia. Uncus long and narrow, broad at central region, from ventral side looks like hood of cobra snake, strongly curved, well sclerotized, tip pointed; acrotergite absent; fenestrula triangular; tegumen shorter than uncus, broad v-shaped; vinculum longer than tegumen, trough shaped, well sclerotized; saccus developed. Valvae with costa linear, narrow, well sclerotized; sacculus well developed, produced to an outgrowth towards proximal end, saccular process developed to a small hook like spine with dense and small setae; harpe+ampulla simple, concave plate like; cucullus curved, sclerotized horn like; valvula membranous flap like, setosed with moderately long setae, tip blunt. Transtilla weakly sclerotized; juxta triangular; aedeagus moderately long and

broad, curved, coecum penis well developed; vesica membranous, cornuti double spined; ductus ejaculatorius entering slightly before tip of coecum penis.

Female genitalia. Corpus bursae obliquely rounded, anterior region weakly sclerotized with irroration of small spines, posterior region more sclerotized, conical signa with corrugated edges; ductus bursae moderately long and broad, well sclerotized; ductus seminalis entering corpus bursae; anterior apophyses longer than posterior apophyses; papilla analis fringed with short setae.

Wingspan. Male 20 mm; female 22 mm.

Remarks. The new species is closely allied to *Lyclene congerens* FELDER in respect to external morphological characters. Reddish orange ground colour of forewing, a diffused discoidal spot, marginal series of fuscous spots and distinct male and female genitalia make it different and distinct from *L. congerens*.

Etymology. The name of species is derived from its unique uncus which is like the head of snake.

***Lyclene hollowai* sp.n.**

(Figs 19-26)

Material examined. Holotype. ♂. India: Gujarat, Saputara, 970 m, 29.IX.05 (Coll. N.S. GILL).

Deposited in the Zoology Museum, Department of Zoology, Punjabi University, Patiala.

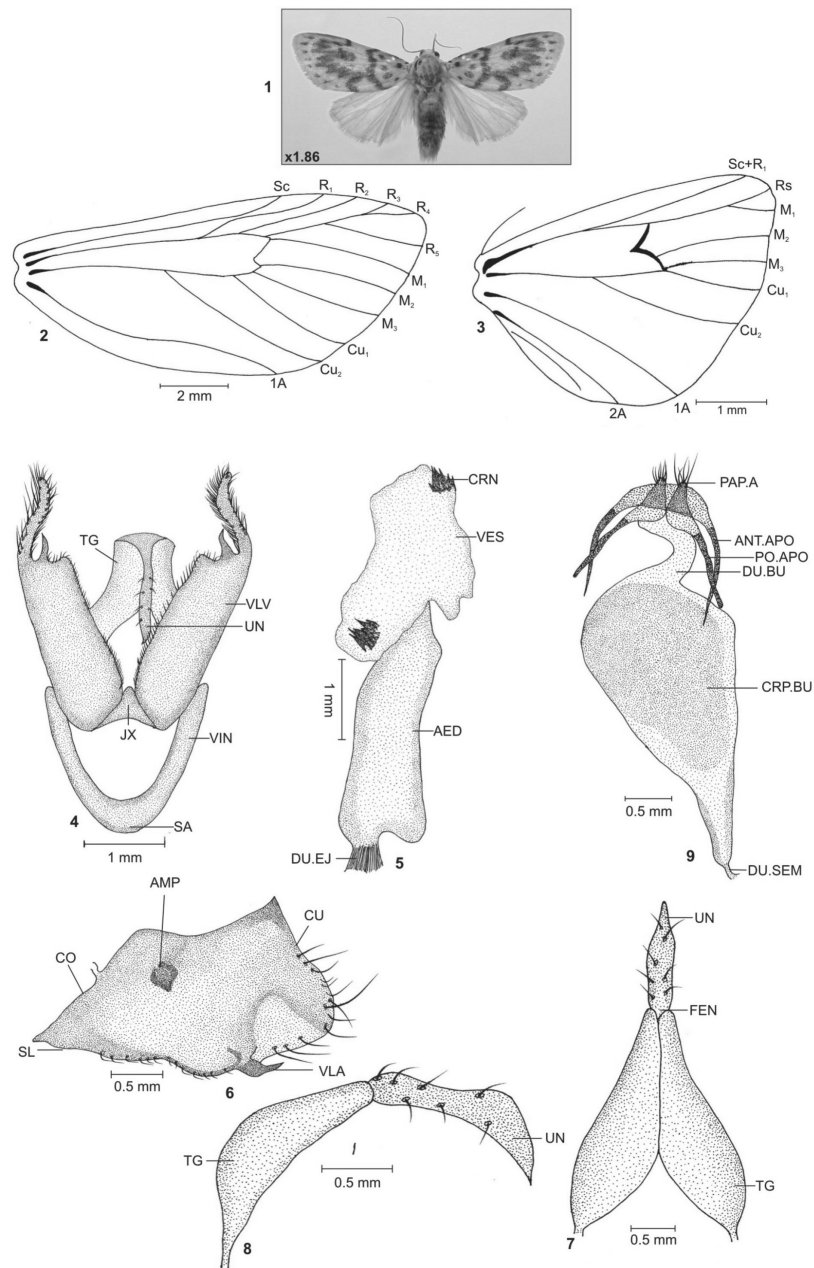
Paratypes. 1♂. India: Gujarat, Ahwa, 520 m, 28.IX.05 – 1♂.

Diagnosis. Head with frons and vertex rufus. Antennae ciliated in male, simple in female; scape, pedicel and shaft covered with ochreous scales. Eyes black with fuscous linings. Labial palpi porrect; covered with ochreous scales.

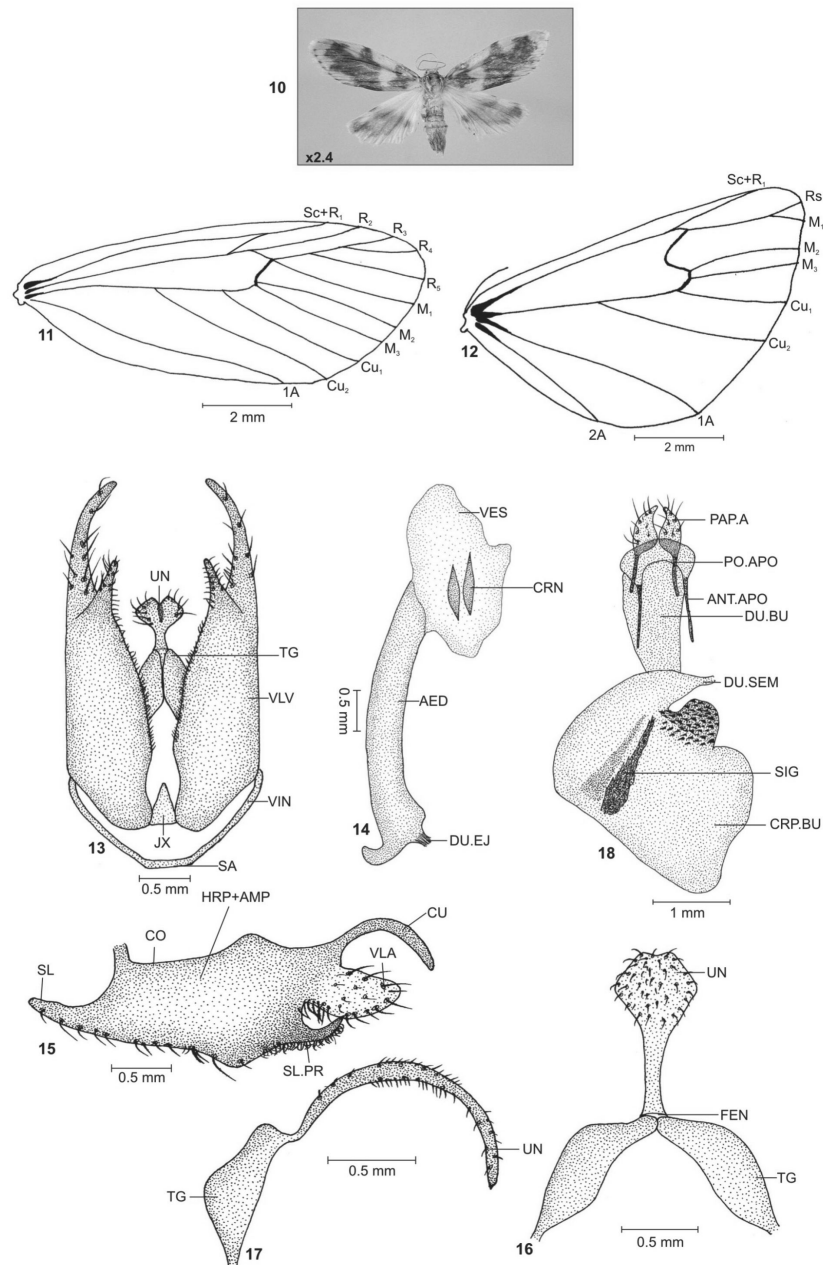
Thorax, collar and tegula rufus; prothorax and tegula spotted with black; pectus rufus. Forewing with ground colour pinkish red; subbasal region irrorated with fuscous scales; a spot at end of cell; a medial black band; postmedial series of black specks, almost conjoined to meet medial band under cell and than again excurved, in some specimens series of specks conjoint to give appearance of complete band; marginal series of black spots; underside same with markings obsolete; fringe ochreous pink; vein Sc and R₁ anastomoses and separates to meet costa; R₂ from cell; R₃, R₄ and R₅ stalked; M₁ from upper angle of cell; M₂ towards discocellulars; M₃ from lower angle; Cu₁ and Cu₂ from cell. Hindwing with ground colour pinkish rufus; underside and fringe same; vein Sc+R₁ originating toward angle of cell; Rs and M₁ stalked; M₂ beyond lower angle; M₃ from angle of cell; Cu₁ and Cu₂ from cell. Legs covered with rufus scales; hind tibia with two pair of spurs. Abdomen covered with ochreous scales; underside and tuft same.

Male genitalia. Uncus strongly built, sickle shaped, well sclerotized, curved, setae absent, tip sharply pointed; acrotergite absent; fenestrula triangular; tegumen longer than uncus, v-shaped; vinculum shorter than tegumen, broad u-shaped, well sclerotized; saccus present. Valvae with costa narrow, curved, well sclerotized; sacculus well developed, produced to an outgrowth towards proximal end; saccular process well sclerotized, leaf like; harpe+ampulla concave plate like; cucullus well developed, sclerotized, tip corrugated with a small spine; valvula membranous flap like, se-

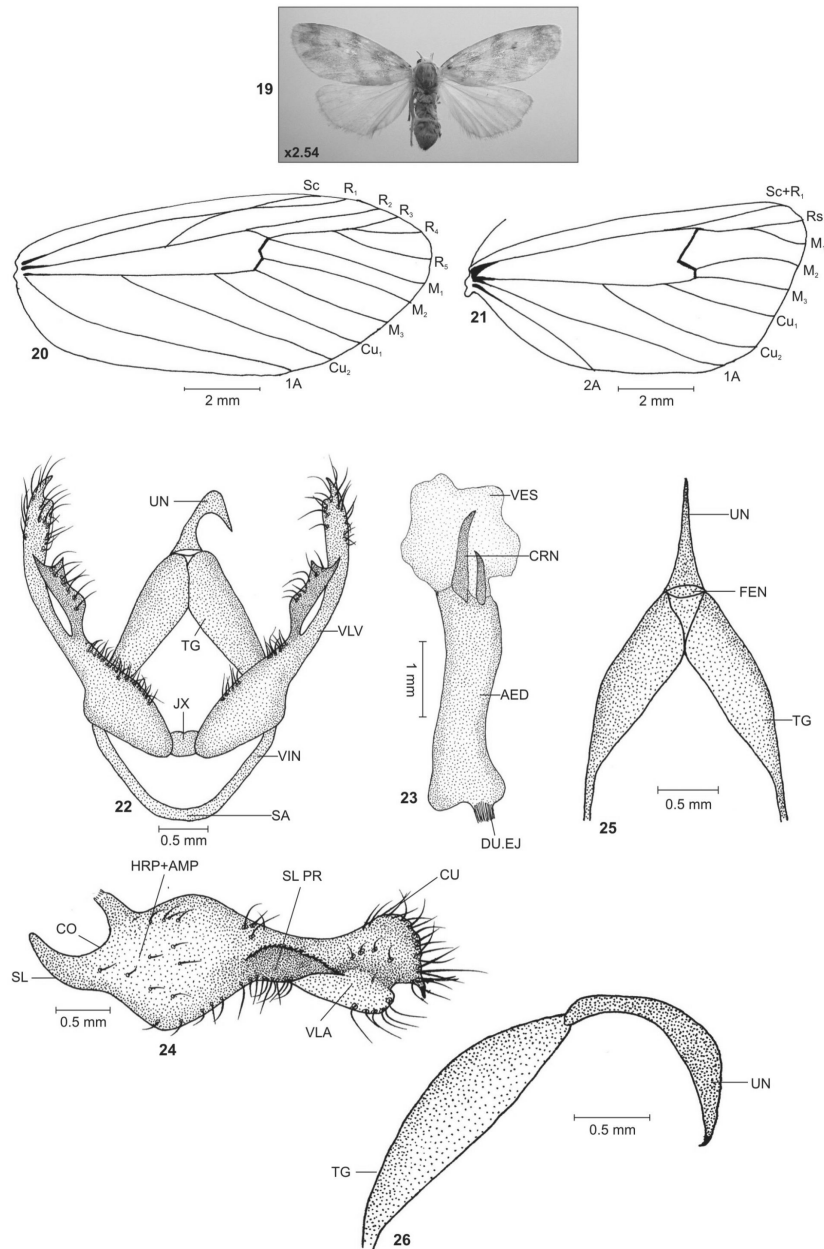
Abbreviations: AED – aedeagus; AMP – ampulla; AMP+HRP – ampulla and harpe (fused); ANT.APO – anterior apophyses; CO – costa; CO.PR – costal process; CRN – cornuti; CRN.PEN – carina penis; CRP.BU – corpus bursae; CU – cucullus; DU.BU – ductus bursae; DU.EJ – ductus ejaculatorius; FEN – fenestrula; HRP – harpe; JX – juxta; PAP.A – papilla analis; PO.APO – posterior apophyses; SA – saccus; SIG – signum; SL – sacculus; SL.PR – saccular projection; TG – tegumen; UN – uncus; VES – vesica; VIN – vinculum; VLA – valvula; VLV – valva.



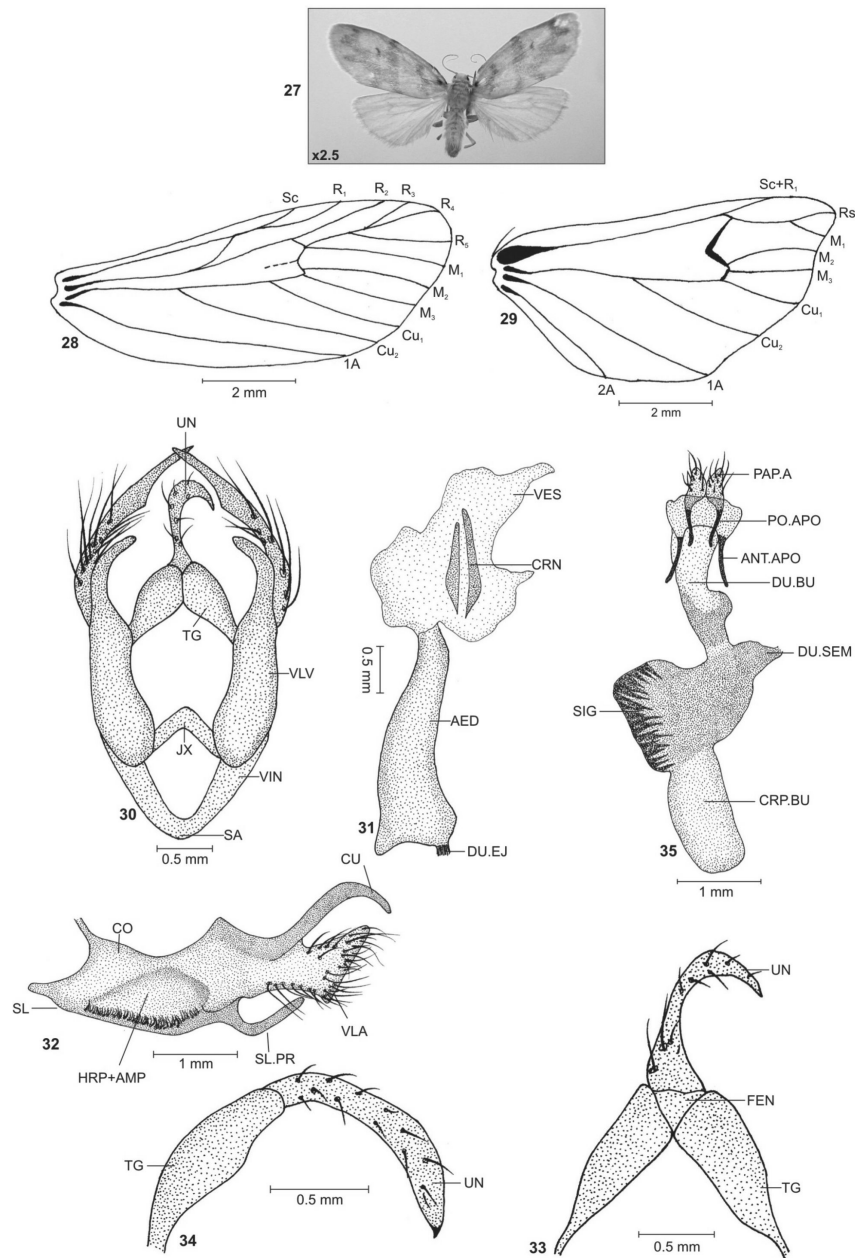
Figs 1-9. 1 – *Lyclene kishidai* sp.n. ♂ (Holotype) 2 – forewing, 3 – hindwing, 4 – male genitalia, 5 – aedeagus, 6 – valva (right), 7 – uncus with tegumen (dorsal view), 8 – uncus with tegumen (lateral view), 9 – female genitalia.



Figs 10-18. 10 – *Lyclene uncalis* sp.n. ♂ (Holotype), 11 – forewing, 12 – hindwing, 13 – male genitalia, 14 – aedeagus, 15 – valva (right), 16 – uncus with tegumen (dorsal view), 17 – uncus with tegumen (lateral view), 18 – female genitalia.



Figs 19-26. 19 – *Lyclene hollowai* sp.n. ♂ (Holotype), 20 – forewing, 21 – hindwing, 22 – male genitalia, 23 – aedeagus, 24 – valva (right), 25 – uncus with tegumen (dorsal view), 26 – uncus with tegumen (lateral view).



Figs 27-35. 27 – *Lyclene goaensis* sp.n. ♂ (Holotype), 28 – forewing, 29 – hindwing, 30 – male genitalia, 31 – aedeagus, 32 – valva (right), 33 – uncus with tegumen (dorsal view), 34 – uncus with tegumen (lateral view), 35 – female genitalia.

tosed with long setae, tip rounded. Transtilla membranous; juxta small plate like; aedeagus long and broad; coecum penis absent; vesica membranous, cornuti double spined; ductus ejaculatorius entering apically.

Wingspan. Male 22 mm.

R e m a r k s. The species is closely allied to *Lyclene rubricosa* MOORE but can be differentiated from it on the basis of forewing markings. An antemedial and postmedial bands are comparatively thinner than that of *rubricosa* MOORE. Besides this, terminal series of fuscous specks is also absent in the new species. *L.hollowai* can also be differentiated from *rubricosa* MOORE on the basis of distinct male genital characters like the shape of valva and uncus.

E t y m o l o g y. The name of the species is dedicated to eminent lepidopterist Dr Jeremy D. HOLLOWAY.

***Lyclene goaensis* sp. n.**

(Figs 27-35)

M a t e r i a l e x a m i n e d. Holotype. ♂. India: Goa, Keri, 90 m, 26.II.04 (Coll. N.S. GILL)

Deposited in the Zoology Museum, Department of Zoology, Punjabi University, Patiala.

Paratypes. 3♂♂, 3♀♀. India: Goa, Keri, 90 m, 26.II.04 – 1♂; Ponda, 85 m, 28.II.04 – 2♂♂, 29.II.04 – 3♀♀.

D i a g n o s i s. Head with frons and vertex covered with rufus scales. Antennae ciliated in males, simple in females; scape, pedicel and shaft covered with dull ochreous scales. Eyes fuscous, densely spotted with black. Labial palpi porrect, furnished with rufus scales.

Thorax, collar and tegula rufus, thorax and tegula spotted with black; pectus rufus. Forewing with ground colour pinkish red; a basal black spot; antemedial black band, not reaching costa; a speck at end of cell; an obliquely placed medial band; a post medial band incurved below cell to meet medial band and again excurved to form structure of K; marginal series of black specks; underside same with markings obsolete; fringe rufus; vein R_1 anastomoses with Sc and separates to meet costa; R_2 from cell; R_3 , R_4 and R_5 stalked; M_1 from upper angle; M_2 and M_3 from lower angle; Cu_1 near angle of cell; Cu_2 from middle of cell. Hindwing with ground colour pinkish red; underside and fringe same; vein Sc+ R_1 near upper angle of cell; Rs and M_1 on a long stalk; M_2 towards middle of discocellulars; M_3 from lower angle; Cu_1 near angle of cell; Cu_2 from middle of cell. Legs covered with rufus scales; hind tibia with two pair of spurs. Abdomen covered with rufus scales; underside and tuft same.

Male genitalia. Uncus short and narrow, covered with short setae, sclerotized, tip ending to a small spine; acrotergite absent; fenestrula triangular; tegumen longer than uncus, v-shaped; vinculum shorter than tegumen, narrow, v-shaped, sclerotized; saccus developed. Valvae with costa narrow, curved, sclerotized; sacculus well developed, setosed with short setae, saccular process curved, spine like; harpe+ampulla concave plate like, well sclerotized; cucullus strongly sclerotized, curved rod like, tip blunt; valvula membranous flap like, setosed with long setae. Transtilla weakly sclerotized; juxta oblique bar shaped; aedeagus short and broad, well sclerotized, coecum penis absent; vesica membranous with slight suffusion of sclerotization, cornuti double spined; ductus ejaculatorius entering apically.

Female genitalia. Corpus bursae irregular, anterior region opaque, posterior region much sclerotized with irroration of small spines; ductus bursae moderately long and broad, membranous posteriorly and sclerotized anteriorly; ductus seminalis entering corpus bursae; anterior apophyses longer than posterior apophyses; papilla analis fringed with small setae.

Wingspan. Male 20 mm; female 24 mm.

R e m a r k s. *Lyclene goaensis* is closely allied to *L. rubricosa* MOORE but is different with respect to markings of the forewings, which are comparatively not prominent and the wing span is

also less than that of *rubricosa* MOORE. The new species is also distinct from *rubricosa* MOORE with respect to external male genitalic attributes like trifold valvae and evenly curved uncus.

E t y m o l o g y. The name of the species pertains to its type locality.

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