Advances in Bioresearch
Adv. Biores., Vol 11 (2) March 2020: 81-91
©2020 Society of Education, India
Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.11.2.8191

Advances in Bioresearch

ORIGINAL ARTICLE

Tribe- Eucosimini (Lepidoptera: Tortricidae) from Kashmir Himalaya, India

Mushtaq Ganai[1*] and Zakir Khan[2]
[1]Research Scholar, Division of Entomology, SKUAST- Kashmir, Shalimar, Srinagar- 190 025.
[2]Professor, Division of Entomology, SKUAST- Kashmir, Shalimar, Srinagar- 190 025.
*Corresponding author:Ganaimushtaq12@gmail.com

ABSTRACT
Study was conducted in Kashmir division of J & K from 2012-15 to know the Tortricid moth fauna belonging to Tribe Eucosimini. Overall, Ten Tortricid moth species belonging to six genera viz., Rhopobota Lederer, Gibberifera Obraztsov, Crocidosema Zeller, Lepteucosma Diakonoff, Eucosma Hubner, Pelochrista Lederer of tribe Eucosimini and sub-family Olethreutinae were collected from the region and dealt with taxonomically. Two species viz., Eucosma gundai sp. nov. and Rhopobota pseudonaevana sp. nov. are being reported as new to science and one specie (Crocidosema plebejana Zeller) as new to region. Besides, an illustrated account of new species, the taxonomic account of already known species has also been added to improve their diagnosis.
Key words: *Eucosma, Gibberifera, Kashmir Himalaya, Lepteucosma, Taxonomy.*

Received 22.11.2019 Revised 18.01.2020 Accepted 01.03.2020

How to cite this article:
M Ganai and Z Khan. Tribe- Eucosimini (Lepidoptera: Tortricidae) from Kashmir Himalaya, India . Adv. Biores., Vol 11 (2) March 2020: 81-91

INTRODUCTION

Eucosimini is the second largest tribe of Olethreutinae in Tortricidae, with about 1000 named species in the world [1]. Razowski [2] published the catalogue of Palaearctic Eucosmina and Enarmoniina, with 457 species in 43 genera of Eucosimini reported. Then Razowski [3] described 215 species from Europe. Liu & Li [4] reported 77 species of Eucosimini from the mainland of China stated that Eucosimini is another large tribe, with approximately 1,650 described species. Their greatest diversity is in the Holarctic, although members of the tribe occur worldwide. The larvae are leaf-rollers, leaf webbers, or stem and root borers. One potential synapomorphy for the tribe is the base of vein M2 bent towards the stalked base of veins M3 and CuA1 in the hindwing. Following this characterisation, the material collected from Kashmir Himalaya have been found to belong ten species of six genera viz., *Rhopobota* Lederer, *Gibberifera* Obraztsov, *Crocidosema* Zeller, *Lepteucosma* Diakonoff, *Eucosma* Hubner, *Pelochrista* Lederer of tribe Eucosimini and sub-family Olethreutinae.

MATERIAL AND METHODS

The study has been carried out in districts Anantnag, Ganderbal, Kupwara, Kargil and Leh of J&K during 2012-2015. Since, Tortricid moths being nocturnal in habit, their collection was done by attracting them to light trap fitted with 125 W mercury vapour lamp and mercury vapour lamp hung along a white cloth sheet secured to a wall. The collected specimens after killing with ethyl acetate vapours were transferred into butter paper envelops and brought to the laboratory, where these were properly stretched in the small adjustable wooden stretching boards or thermocol sheets after pinning through the mid of mesothorax. The stretched specimens were then kept in insect storage boxes, fumigated with naphthalene balls. Before storage, each specimen was furnished with data such as name of the locality, locality altitude, date of collection, and name of the collector etc. [5]. For permanent slide preparation of wings, method proposed by Common [6] and advocated by Zimmerman [7] was followed, while as for slide preparation of male and female genitalia, the method suggested by Robinson [8] was followed with

slight modification. The specimens after sorting were identified with the help of relevant literature and communication channel was also established with the eminent taxonomists currently working on family Tortricidae around the globe. The identification was confirmed by sending adult, wing and genitalia photographs to these tortricid experts for examination and validation of species.

RESULTS AND DISCUSSION

Members of tribe Eucosimini have forewing fasciae patterned with pre-apical fascia often reduced and costal fold in males. Hind wing with stalked Cu A_1 and M_3. Male genitlia with single or bilobed uncus, socii broad round or triangular, aedeagus with deciduous cornuti, valvae are with single or double branched costal hook and basal excavation. Female genitalia with ductus bursae provided with or without sclerotization near ostium but often with sclerotized ring near ductus seminalis and signum variable often cornuate or blade like.

Genus *Eucosma* Hubner

Hubner, 1823, *Zutr.Samml.exot.Schmett.* 2: 28.
Type species: *Tortrix circulana* Hubner, 1823.
Distribution: Palaearctic, Nearctic and Oriental regions.

Eucosma conterminana (Guenee, 1845)

conterminana Guenee, 1845 (*Catoptria*), *Annls Soc.ent. Fr.* (2) 3: 189.
Catoptria conterminana Guenée, 1845, *Annls Sc.ent. Fr.*, (2)3: 189.
Eucosma caecimaculata Duponchel, 1835, *Hist. Nat. Lépid. Papillons Fr.*, 9: pl. 249.
Description: Adult (Figure 1a): Head and thorax brown. Forewing costa convex at base, slightly concaving post-medially; termen oblique, ground colour pale, sprinkled with rust; veins suffused with same colour. Hindwing pale brownish, creamy towards base.
Male genitalia (Figure 2a): Uncus slender, round apically; socii rudimentary flat; tegumen long and thin; vinculum oval shaped; membranous part of valve straight dorsally and terminal process of sacculus pointed and hairy; basal cavity thin and elongated; aedeagus slender, distinctly extending ventro-terminally; coecum penis long, perpendicular to the latter; cornuti two in vesica.
Female genitalia (Figure 3a): Papilla analis short, anterior apophyses slightly shorter than posterior apophyses; sterigma funnel shaped, distal edge of postostial sterigma projecting medially, submedian part slightly expanding laterally, proximal portion short; ductus bursae very short; corpus bursae swollen and oval; cestum short, hardly reaching middle of the latter; signum slender, long, with small sized capitulum.
Wing span: Male 17 mm, Female 18 mm.
Material examined: Gutlibag, 06.v.11-1♂; 08.vii.13-1♂; Kundalgam, 10.v.12-1♂; 26.viii.11-1♂; Kangan, 09.vi.12-1♂; 12.ix.12-1♂; 10.vi.13-1♂,1♀; 11.ix.13-1♂; 14.vii.12-3♂, 1♀.
Distribution: Central Asia, China (Inner Mongolia, Hebei, Ningxia, Xinjiang), Europe, Iran, Kazakhstan, Mongolia, Russia.
Eucosma conterminana (Guenée, 1845) was described by Bradley [9] Razowski [10] for the first time recorded this Palaearctic specie from the Oriental region (Kashmir &Ladakh). During the present research, few adult representatives of this species were collected from different localities of Kashmir and Ladakh and identified from the relevant literature as *Eucosma conterminana* Guenee.

Eucosma gundai sp. nov.

Description: Adult (Figure 1b): Head with frons covered with brown scales; vertex clothed with creamy scales; antennae with brown scape, pedicel and flagella dark; eyes black; labial palpi obliquely porrect and heavily clothed with dark scales; thorax, collar and tegula covered with dark scales. Forewing without costal fold; ground colour pale ochreous-white, lightly suffused with brown; costa marked wholly with brownish strigulae; yellowish brown markings mixed with dark brown; basal and sub-basal fasciae diffused, basal patch weakly strgulated; median fascia costally poorly defined, pre-tornal marking slightly darker; medio-dorsally large and conspicuous sub triangular blotch of light ground colour; indeterminate sub terminal fascia; cilia whitish grey basally and apically ochreous-brown. Hindwing ground colour same as in forewing; ochreous-white cilia, with sub-apical and dark sub-basal lines. Legs furnished with ochreous scales; midleg tibiae with one and hind tibiae with two pair of spurs.
Male genitalia (Figure 2b): Uncus well developed, short, with pointed apex; socius finger like, slightly elongate and hairy; tegumen as long as uncus and inverted u shaped; vinculum shorter than tegumen, weakly sclerotized, broad u-shaped; saccus small; tuba analis lightly sclerotized and weakly connected with tegumen by sclerites; valvae well differentiated into costa and sacculus and concave ventrally; neck of valva with high concentration of bristles; cucullus very short, broad, ventrally angulated, bristled and

 © 2020 Society of Education, India

spined; valva variably developed with bristles and spines on neck and sacculus; basal opening with posterior edge rather expanding sub dorsally, hairy or bristled; juxta simple and membranous; aedeagus very short, with some short cornuti, a bunch of deciduous spines.
Female: Not examined
Wing span: Male 14 mm.
Material examined: Holotype: ♂ India, Jammu & Kashmir: District Ganderbal; Gund, 2787 m, 34.30 N, 75.28 E, 10.vii.12, Mushtaq Ganai (Genitalia Slide BSL 18a) (SKUAST-Kashmir).
Paratype: ♂ India, Jammu & Kashmir: District Ganderbal; Sonamarg, 2800 m, 34.30 N, 75.29 E, 5.viii.13, Mushtaq Ganai (Genitalia Slide BSL 18 b) (SKUAST-Kashmir).
Distribution: Kashmir (India).
Etymology: The name of the species refers to its collection locality "Gund".
The male specimens representing the genus Eucosma could neither be identified through literature nor by tortricid moth experts and is named as new species *Eucosma gundai* sp. nov. The new species is closely allied to *Eucosma conterminana* Guenee and *Eucosma candida*, but differs from them in terms of certain male genitalic features like pointed apex of uncus, inverted u shaped tegumen, vinculum and shape of valvae.

***Eucosma tetraplana* (Moschler, 1866)**

tetraplana Moschler, 1866 (*Grapholitha*), *Berl. Ent. Z.* 10: 148.
Description: Adult (Figure 1c): Head dark brown; thorax greyish-brown. Ground colour of forewing greyish cream sprinkled and suffused with grey colour; ocellus creamy with distinct spots. Hindwing light fuscous or grey with a patch of dark scales on upper side; cilia grey with a sub-basal line dark coloured.
Male genitalia (Figure 2c): Uncus broad, pointed apically; Tegumen broad; socii short and round; cucullus curved coastally, ventrally bent and terminally pointed and hairy, basal cavity thick and elongated, aedeagus slender long, distinctly extending ventro-terminally; cornuti two.
Female: Not examined
Wing span: Male 15 mm,
Material examined: Gawran, 14.vii.12-2♂; Silikchi, 27.vii.12-1♂; Sirgufara, 15.viii.13-2♂; Brariangan, 14.vi.13-1♂; Kharbo, 26.vi.13-1♂; Khalsi, 01.vii.11-1♂; 22.vi.12-1♂; 19.vii.12-2♂; 19.viii.12-3♂; Lolab, 12.vii.13-1♂.
Distribution: Palaearctic: E Europe, Near East, Asia Minor, Iran, Transcaucasia, Siberia, Mongolia, Russian Far East: Primorsk.
This species was collected and described by Bradley [9] and also Razowski [10] for the first time collected this species from high altitude of Khardungla Ladakh and described it in detail. The present collection comprised few specimens which have been found conspecific on the basis of male and has been identified as *Eucosma tetraplana* Moschler.

Genus *Rhopobota* Lederer

Lederer, 1859, *Wien. ent. Monatschr.* 3: 366.
Type species: *Tortrix naevana* Hubner, [1814-1817].
Distribution: Australian, Nearctic and Oriental regions.

***Rhopobota naevana* (Hubner, 1817)**

naevana Hubner, [1814-1817] (*Tortrix*), *Samml. Eur. Schmett.* 7: pl. 41 fig. 261.
Tortrix naevana (Hubner, 1817):pl.41, fig.261.
Tortrix unipunctana (Haworth, 1811):454.
Lithographia geminana Stephens, 1852:99.
Sciaphila luciferana Walker, 1863:342.
Anchylopera vacciniana Packard, 1869:338.
Epinotia ilicifoliana Kearfott, 1907:58.
Acroclita microrryncha Meyrick, 1931:127
Rhopobota naevana Lederer, 1859:367.
Description: Adult (Figure 1d) head vertex with brown scales; frons white; antenna brown except white scape; labial palpus with basal two segments brown, third segment small, white and porrect; Thorax with dorsum and tegula greyish brown. Forewing with upper side ground colour gray, sparsely strigulated with brown or fuscous and a distinct notch below apex; basal patch and median fascia indistinct; chorda extending from R1-R2 to mid R5-M1, M-stem to CuA1 or base of M3; R4-R5 separate or stalked. Hindwing light fuscous or grey with a patch of grey scales on upper side and a patch of grey-black scales on underside; cilia grey with a sub-basal line dark coloured; M2 and CuA1 fused or stalked. Fore leg brown; mid leg greyish brown, tarsus with brown scales; hindleg gray, tarsus brown; Male with specialized scales on underside.

 © 2020 Society of Education, India

Male genitalia (Figure 2d) with uncus well developed, bifid apically with two wide-set projections, triangular at base; gnathos weakly developed; tegumen broad, longer than uncus, inverted u shaped, apically round with a pair of sub-lateral projections; vinculum shorter than tegumen, u-shaped, weakly sclerotized; socii fuse with the base of tuba analis and consisting of two lateral appendages on it which expand apically, covered with bristles and fuse; sacculus not angulated terminally; valvae well developed provided with long clasper at mid-point of ventral margin; cucullus with its caudal edge simple and spined; aedeagus small, simple with both types of cornuti, ductus ejaculatorious entering apically.

Female genitalia (Figure 3b) corpus bursae oval shaped with distal sclerotized portion long and thick and single signum with elongated basal plate; ductus bursae medium, highly striated, simple and weakly sclerotized towards ostium bursae; sterigma small, funnel shaped, terminally expanding, accompanied with small scobinate patches or posterior lobes; antrum with long sclerites near the inception of ductus seminalis; posterior apophyses longer than anterior apophyses; papilla analis long, slightly sclerotized, sparsely setosed with micro and macro setae.

Wing span: Male 11 mm, Female 12 mm.

Material examined: Akingam, 06.vi.12-5♂, 1♀; Kangan, 09.vi.12-2♂, 1♀; 10.vi.13-3♂,2♀; 21.viii.13-2♂,4♀; 16.ix.12-1♂; Lolab, 14.vi.12-3♂, 1♀; 12.vii.13-1♂,4♀.

Distribution: Palaearctic, Nearctic, Oriental and Australian regions.

***Rhopobota pseudonaevana* sp. nov.**

Description: Adult (Figure 1e): Head vertex with brown scales; frons white; antenna brown except white scape; labial palpus with basal two segments brown, third segment small, white and porrect. Forewing with upper side ground colour gray, sparsely strigulated with brown or fuscous and a distinct notch below apex; basal patch and median fascia indistinct; chorda extending from R_1-R_2 to mid R_5-M_1, M-stem to CuA_1 or base of M_3, R_4-R_5 separate or stalked. Hindwing light fuscous or grey with a patch of grey scales on upper side and a patch of grey-black scales on underside; cilia grey with a sub-basal line dark coloured; M_2 and CuA_1 fused or stalked. Foreleg brown; midleg greyish brown, hindleg gray, tarsus brown. Male moth with specialized scales on underside.

Male genitalia (Figure 2e): Uncus well developed, bifid apically with two wide-set projections, triangular at base; gnathos weakly developed; tegumen broad, longer than uncus, inverted u-shaped, apically round with a pair of sub-lateral projections; vinculum shorter than tegumen, u-shaped, weakly sclerotized; socii fuse with the base of tuba analis and consisting of two lateral appendages on it which expand apically, covered with bristles and fuse; sacculus not angulated terminally; valvae well developed provided with long clasper at mid-point of ventral margin; cucullus with its caudal edge simple and spined; aedeagus small, simple with both types of cornuti, ductus ejaculatorious entering apically.

Female genitalia (Figure 3c): Corpus bursae spindle shaped with distal sclerotized portion long and thick and single signum with elongated basal plate; ductus bursae short, highly striated, simple and weakly sclerotized towards ostium bursae; sterigma small, funnel shaped, terminally expanding, accompanied with small scobinate patches or posterior lobes; antrum with long sclerites near the inception of ductus seminalis; posterior apophyses longer than anterior apophyses; papilla analis long, slightly sclerotized, sparsely setosed with micro and macro setae.

Wing span: Male 11 mm, Female 12mm.

Material examined: Holotype: ♂ India, Jammu & Kashmir: District Kupwara; Lolab, 1696 m, 34.30 N, 74.22 E, 05.vi.12, Mushtaq Ganai (Genitalia Slide BSL 21a) (SKUAST-Kashmir).

Allotype: ♀ India, J & K: District Anantnag; Gawran, 2073 m, 33.32 N, 75.17 E, 14.vii.12, Mushtaq Ganai (Genitalia Slide BSL 21b) (SKUAST-Kashmir).

Etymology: The species name *pseudonaevana* refers to its close resemblance with species *naevana* (Hübner) of genus *Rhopobota* Lederer.

The individuals representing the genus Rhopobota could neither be identified through literature nor by tortricid moth experts and is presently named as new species *Rhopobota pseudonaevana* sp. nov. This species is closely similar with *Rhopobota naevana* (Hubner, 1817) in general maculation and in generalized structure of the external genitalia. However, the external male genitalia differ from that of *naevana* (Hübner) in the shape of valvae, size of clasper at ventral margin of valvae and female genitalia in the shape of corpus bursae and its distal sclerotized portion.

Genus *Pelochrista* Lederer

Lederer, 1859, *Wien. ent. Monatschr.* 3: 331.

Type species: *Paedisca mancipiana* Mann, 1855

Distribution: Nearctic region.

***Pelochrista teleopa* Razowski, 2006**

teleopa Razowski, 2006 (*Pelochrista*), *Acta Zool. Cracov.* 49B: 129.

 © 2020 Society of Education, India

Pelochrista telopea Razowski, 2006
Description: Adult (Figure 2f): Head cream hardly tinged with brownish. Forewing rather slender; termen rather short weakly oblique, tolerably straight; ground colour pale cinnamon densely scaled darker, more brown in distal fourth especially towards tornus; costal strigulae atrophied; markings much darker than ground colour rust brown consisting of dorso-post-basal blotch and tornal blotch; cilia concolorous with wing. Hindwing brownish tinged cream in basal area cilia concolorous with post-basal part of wing.
Male genitalia (Figure 2f): Top of tegumen rather small; socius broad; valva long with very slender cucullus and strong pollex; sacculus large, simple, rounded terminally; pulvinus fairly large; aedeagus long.
Female genitalia (Figure 3d): Female genitalia with papilla analis some what tapering terminad; apophyses posterior shorter than apophyses anterior; sterigma broad, rounded basally; ductus bursae short and corpus bursae round; sclerites of cingulum and corpus bursae thin and weak; signa two, one large sickle-shaped, the other small rounded.
Wing span: Male-18 mm, Female-19 mm
Material examined: Khalsi, 31.vii.12-2♂; 19.vii.12-2♂; Shargol, 03.viii.12-1♂; Pahalgam.10.viii.12-1♂, 2♀; Sonamarg, 5.viii.12-1♂, 2♀.
Distribution: India (Jammu & Kashmir)

Genus *Crocidosema* Zeller

Zeller, 1847, *Isis von Oken* (*Leipzig*) 1847(10): 721.
Type species: *Crocidosema plebejana* Zeller, 1847.
Distribution: Cosmo politic.

***Crocidosema plebejana* Zeller,** 1847
plebejana Zeller, 1847 (*Crocidosema*), *Isis von Oken* (*Leipzig*) 1847 (10): 721.
Crocidosema plebeiana Zeller
Crocidosema ptiladelpha Meyrick, 1917
Crocidosema synneurota Meyrick, 1926
Crocidosema? insulana Aurivililus, 1922
Eucosma plebeiana Zeller
Grapholitha peregrinana Moeschler, 1866
Paedisca lavaterana Milliere, 1863
Penthina altheana Mann, 1855
Proteopteryx blackburnii Butler, 1881
Steganoptycha obscura Wollaston, 1879
Description: Adult moth (Figure 2g): Male brown to black with conspicuous white ocellus and dorsal patch. Forewing creamy white, variably suffused with ochreous and strigulated with fuscous; greyish markings, costly absolescent basal patch; median fascia defined poorly and pretornal marking triangular; subterminal fascia arise from middle of termen marked with a blackish dash and dilated in distal area upper part; brown often triangular spot proceeds the ocellar spot, which is dull whitish with two thin and dark longitudinal lines, proceeded and followed by shining silvery-grey patches; costal fold absent; chorda and M-stem well developed, R_4 and R_5 in close proximity. Hindwing greyish, cilia whitish grey, with a dark subbasalline; large tuft of upright, dark-brown scales present at the base of Cu vein; cubital pectin on large and prominent; M_2 and Cu A_1 stalked or fused, M_1 in close proximity to R.
Male genitalia (Figure 2g): Uncus rudimentary, pointed, and hairy; gnathus subanal plate like; socius large and curved outwards, long, broad, somewhat oval and pad like with backwardly directed dense hairs; tuba analis small, well developed and strongly sclerotized; tegumen thin, long; juxta triangular; valva with short basal opening and highly constricted medially; sacculus broad, triangular with distinct posterior angle and with a group of fine bristles medially; cucullus bristled and broad; aedeagus simple with a bunch of deciduous cornuti and slightly curved pointed lower lip.
Female: Not found.
Wing span: Male 16 mm.
Material examined: Ganjipora, 07.vi.12-2♂; Kupwara, 20.vii.12-1♂; Batkoot, 15.vii.12-2♂; Khalsi, 31.vii.12-1♂.
Distribution: Asia Minor, Australia, Cyprus, Denmark, Egypt, Ecuador, France, Galapagos, Germany, India, Iran, Italy to the Balkan Peninsula, Japan, Southern Europe, Spain and Northern Africa: Morocco, Sudan; Ukraine, Trans-Caucasus, Turkmenistan; Thailand, Taiwan, North America: Texas and California; South America: Peru, Islands.

 © 2020 Society of Education, India

Genus *Gibberifera* Obraztsov

Obraztsov, 1946, *Z. Wien. ent. Ges.* 30: 35.

Type species: *Penthina simplana* Fisher V. Roeslerstamm, 1836

Distribution: Oriental & Palaearctic regions.

3.5 1 *Gibberifera obscura* Diakonoff, 1964

obscura Diakonoff, 1964 (*Gibberifera*), *Verff. Zool. Staatsamml. Mnchen* 8: 48.

Description: Adult (Figure 1h): Adult with rough head above; labial palpi short; antenna simple thread like. Forewing triangular, elongated without costal fold; ground colour fuscous and ventral surface greyish brown; costa with few pairs of white coloured costal strigulae from apex to middle. Forewing with 12 separate veins; R_3 and R_4 approximate towards base; R_4 upto costa; R_5 upto termen; Cu A_1 bent; Cu P reduced; discal cell with stem of $R_4 \pm R_5$ (chorda) and M stem distinct. Hindwing unicolour with 8 veins; RS and M_1 approximate; M_3 and Cu A_1 stalked; Cu P rudimentary.

Male genitalia (Figure 2h): Male genitalia with stick-shaped, slender uncus, protruded ventrally and apically bifurcated; tuba analis well developed triangular in outline; tegumen broad, shoulders rounded; socii triangular lobes; gnathus sclerotized weakly; vinculum reduced; valva long and broad constricted with distinct neck; basel opening large; sacculus setose; cucullus weakly sclerotized with prominence on the inner edge; aedeagus cone shaped, short with several deciduous cornuti and spine like non deciduous cornuti at the tip.

Female genitalia (Figure 3e): Female genitalia with short ductus bursae having sclerotized ring on posterior side; ostium bursae moderate; corpus bursae globular with two horn shaped signa on proximo-lateral side; anterior apophyses longer than posterior apophyses; papillae analis flat; sterigma developed, wide plate without setae.

Wing span: Male 17 mm, Female 19 mm.

Material examined: 06.vi.12-2♂; Gund, 10.vii.13-1♂; Gawran, 14.vii.12-3♂, 2♀; Kangan, 10.vi.13-2♂; 14.vii.12-2♂; 15.viii.12-2♂,1♀.

Distribution: India (J&K), Nepal and Pakistan.

During this study, few adult specimens of this species were collected from different localities of Kashmir and Ladakh and identified from the relevant literature as *Gibberifera obscura* Diakonoff. Diakonoff [11] established this species later on Razowski [10] treated this specie in detail.

Genus *Lepteucosma* Diakonoff

Diakonoff, 1971, *Verff. Zool. Staatsamml. Mnchen*15: 179.

Type species: *Lepteucosma oxychrysa* Diakonoff, 1971

Distribution: Oriental & Palaearctic regions.

3.6.1 *Lepteucosma charassuncus* Razowski, 2006

charassuncus Razowski, 2006 (*Lepteucosma*), *Acta Zool. Cracov.*49B: 128.

Description: Adult (Figure 1i): Head cream brown; thorax pale brownish. Ground colour of forewing greyish cream sprinkled and suffused with grey especially in basal third; submedian part and distal fourth cream; ocellus dirty cream with indistinct spots; markings dark brownish grey in form of large subtriangular costal blotch tinged with rust ochreous beneath middle of wing, brown medially and posteriorly; costal strigulae indistinct, dividing rust brown; apex spot pale ochreous ferruginous; cilia (rubbed) concolorous with ground colour. Hindwing brownish grey, cilia paler.

Male genitalia (Figure 2i) base of uncus short, convex laterally, terminal bifurcation long, slightly curved; socius broad; neck of valva almost as long as ventral lobe of cucullus.

Female genitalia (Fig. 3f) with large round corpus bursae; ductus bursae short; sterigma large with convexly rounded anteostial part; terminal part of ductus bursae (antrum) weakly sclerotized; signum single thorn shaped with plate like sclerite.

Wing span: Male 15 mm, Female 16 mm.

Material examined: Ganjipora, 07.vi.12-1♂; Gawran, 14.vii.12-2♂, 1♀; Kupwara, 20.vii.12-2♂; 27.viii.13-3♂, 2♀; Pahalgam.10.viii.12-3♂,1♀; Dardpora, 19.viii.12-2♂, 1♀.

Distribution: India (J&K).

Razowski [10] first time gave the photographs of external male genitalic structures of the species *charassuncus* Razowski and also described it in detail. He argued that this species is closely allied with *Lepteucosma oxychrysoides* Kuznetzov, 1997 from Vietnam, but differs from former by a broader base of uncus, much slenderer socius and short neck of valva.

***Lepteucosma srinagara* Razowski, 2006**

srinagara Razowski, 2006 (*Lepteucosma*), *Acta Zool. Cracov.* 49B: 127.

Description: Male adult (Figure 1j): Head and anterior thorax creamy brown coloured; remaining thorax brown. Forewing costa with costal fold; termen concave below apex. Ground colour white terminally and

 © 2020 Society of Education, India

sub-medially from beneath apex to tornus included ocellus; costal strigulae fine and whitish; dark brown marking in form of broad diffuse median line and trace of dorso-basal blotch. Cilia whitish grey, darker at apex. Hindwing with brownish cilia paler in colour. Male with forewing more or less dark, apex rust; dorsal part of termen, Female with well developed post-basal white area and weaker terminal white portion limited to ocellus only.

Male genitalia (Figure 2j): Uncus very broad, narrow medially, concave towards apex; socius broad slender distally; neck of valva long, slender; ventral lobe of cucullus large and slender than dorsal lobe; aedeagus long, slender, with simple terminal part.

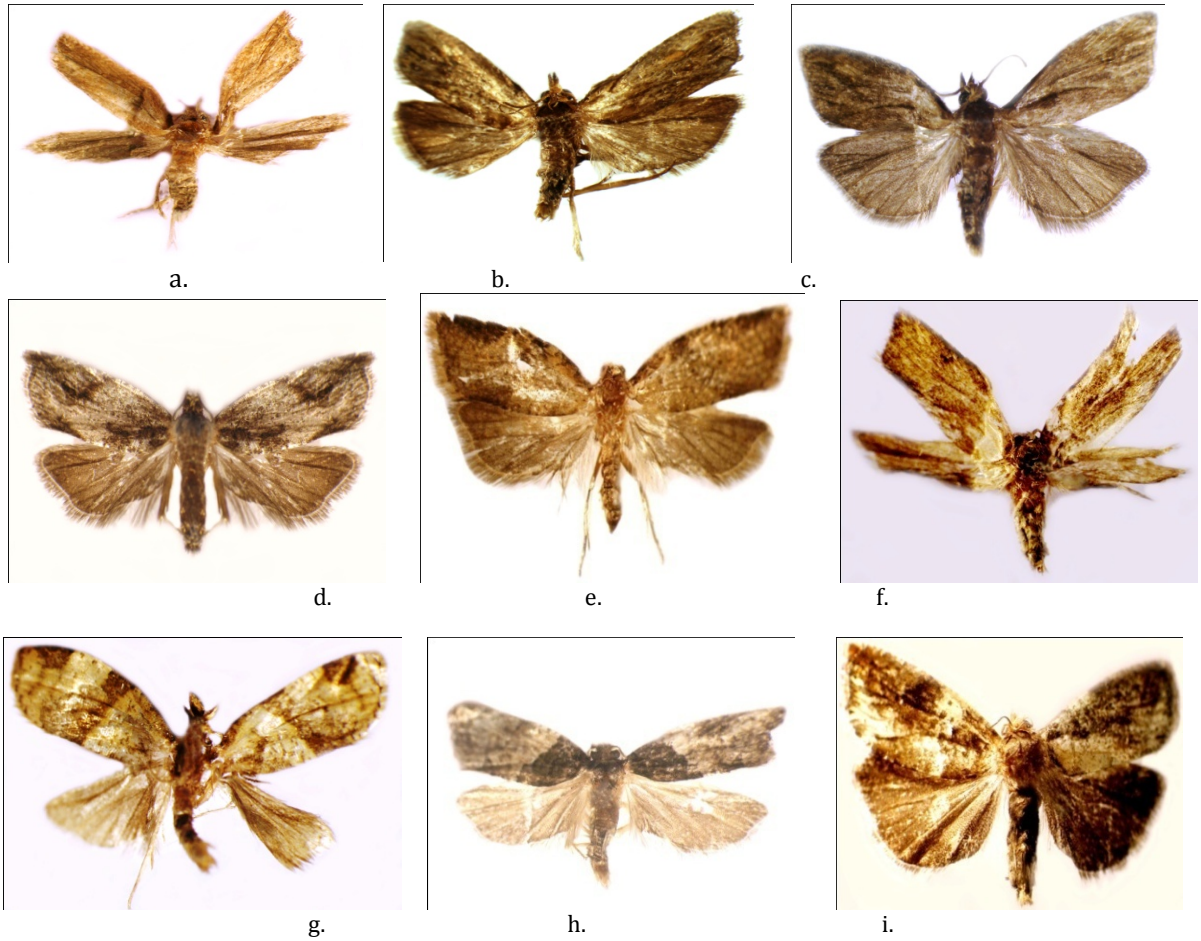
Female genitalia (Figure 3g); Sterigma very large with anteostial part convexly round; terminal part of ductus bursae lightly sclerotized; sclerite of cingulum stronger than the antrum.

Wing span: Male 19 mm, Female 20 mm.

Material examined: Gund, 10.vii.12-1♂; Gawran, 14.vii.12-1♂; Brariangan, 14.vi.13-1♂; Batkoot, 23.vii.13-1♂,1♀; Gutlibag, 08.vii.13-1♂; Sonamarg, 20.viii.13-1♂,1♀; 16.viii.12-1♂; Khidam, 07.vi.12-1♂; Ganderbal, 15.vi.12-1♂; Kangan, 14.vii.12-1♂,1♀; Gadool, 07.viii.12-1♂.

Distribution: India (J&K).

Few adult representatives of this species were collected from different localities of Kashmir and identified from the relevant literature as *Lepteucosma srinagara* Razowski. It was found Close to *Lepteucosma aethopa* (Diakonoff, 1984), from West Sumba but the uncus was observed slightly different which was also realised by Razowski [10]. The external male and female genitalia of the species has been described and illustrated in detail by Razowski [10].



a. b. c.

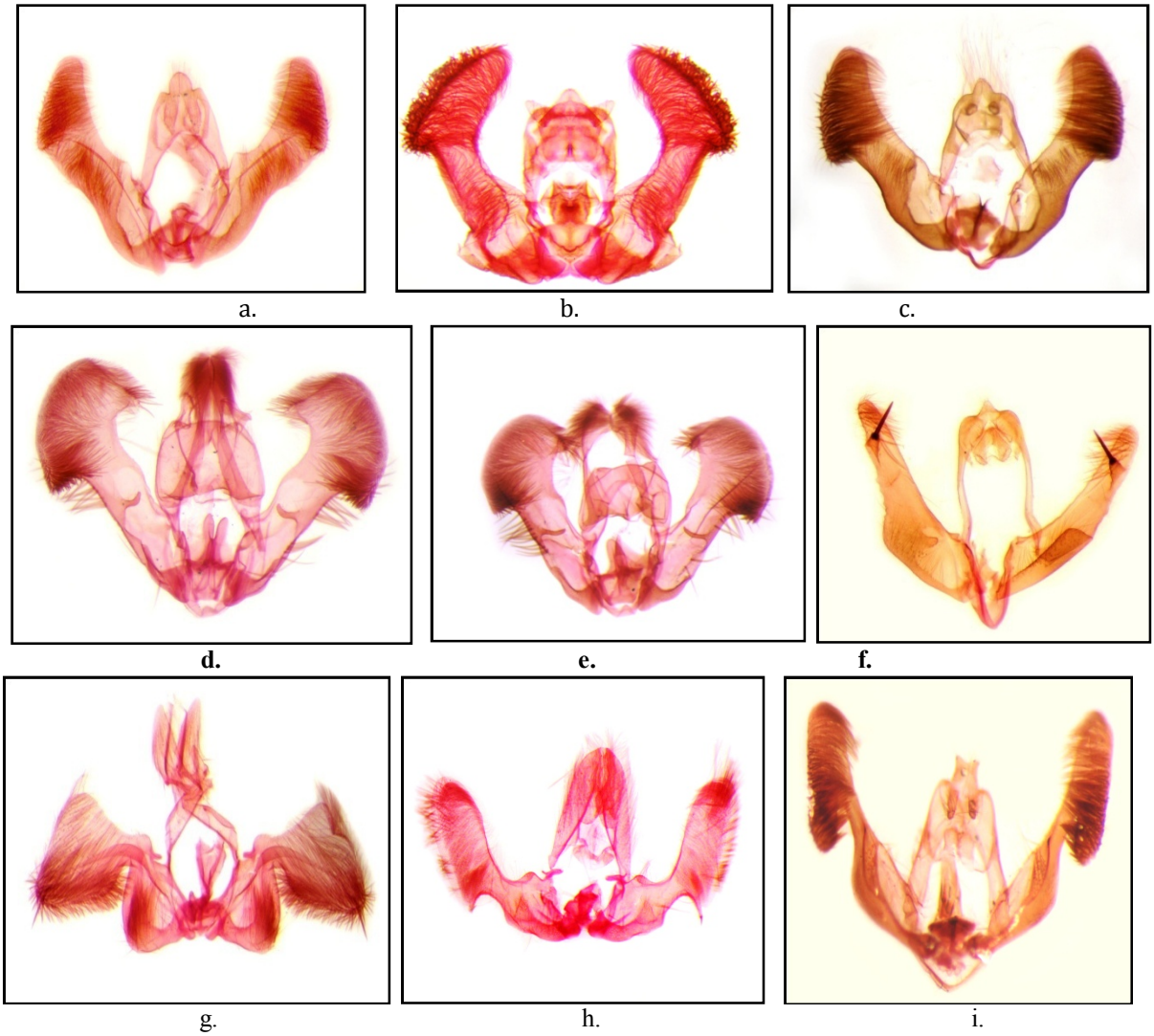
d. e. f.

g. h. i.

 © 2020 Society of Education, India

j.

Figure 1: Adult moths. a. *Eucosma conterminana* (Guenee, 1845), b. *Eucosma gundai* sp. nov., c. *Eucosma tetraplana* (Moschler, 1866), d. *Rhopobota naevana* (Hubner, 1817), e. *Rhopobota pseudonaevana* sp. nov., f. *Pelochrista teleopa* Razowski, 2006, g. *Crocidosema plebejana* Zeller, 1847, h. *Gibberifera obscura* Diakonoff, 1964, i. *Lepteucosma charassuncus* Razowski, 2006, j. *Lepteucosma srinagara* Razowski, 2006.



a. b. c.

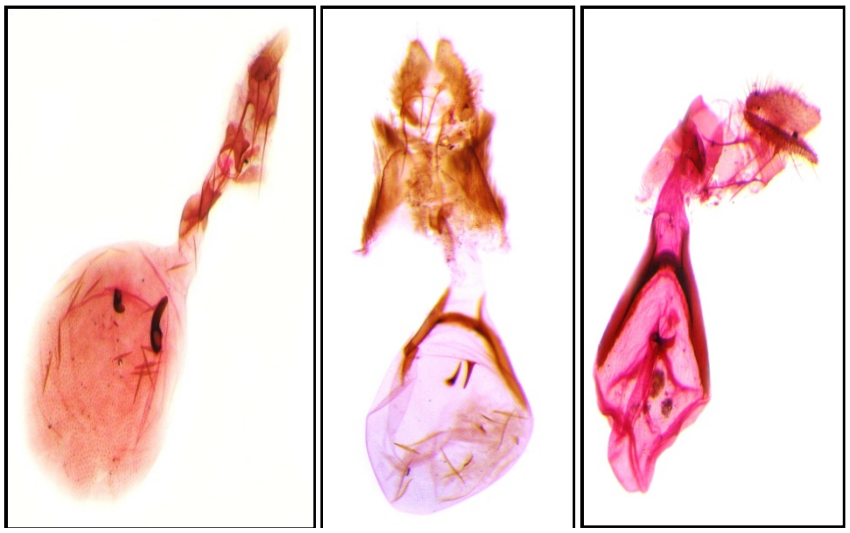
d. e. f.

g. h. i.

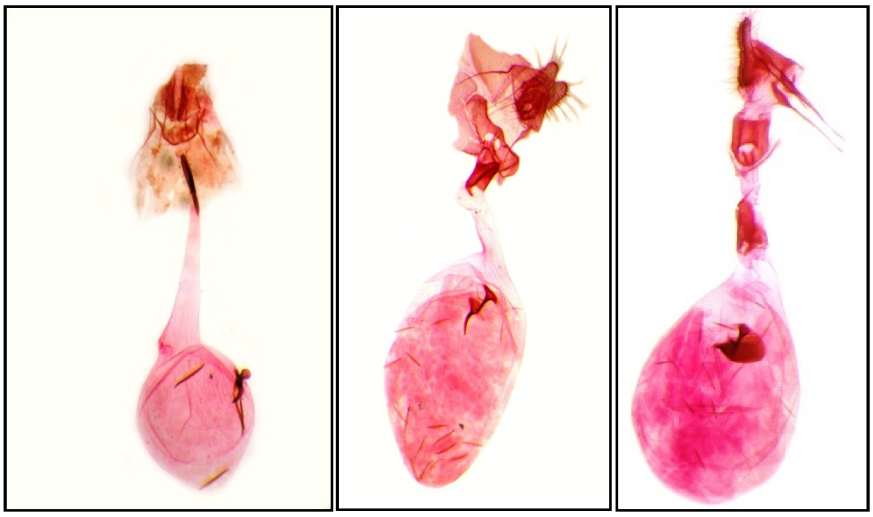
 © 2020 Society of Education, India

j.

Figure 2: Male genitalia. a. *Eucosma conterminana* (Guenee, 1845), b. *Eucosma gundai* sp. nov., c. *Eucosma tetraplana* (Moschler, 1866), d. *Rhopobota naevana* (Hubner, 1817), e. *Rhopobota pseudonaevana* sp. nov., f. *Pelochrista teleopa* Razowski, 2006, g. *Crocidosema plebejana* Zeller, 1847, h. *Gibberifera obscura* Diakonoff, 1964, i. *Lepteucosma charassuncus* Razowski, 2006, j. *Lepteucosma srinagara* Razowski, 2006.



a. b. c.



d. e. f.

 © 2020 Society of Education, India

g.

Figure 3: Female genitalia. a. *Eucosma conterminana* (Guenee, 1845), b. *Rhopobota naevana* (Hubner, 1817), c. *Rhopobota pseudonaevana* sp. nov., d. *Pelochrista teleopa* Razowski, 2006, e. *Gibberifera obscura* Diakonoff, 1964, f. *Lepteucosma charassuncus* Razowski, 2006, g. *Lepteucosma srinagara* Razowski, 2006.

CONCLUSION

In Kashmir Himalayan region (North-west) of India, ten species belonging to six genera viz., *Rhopobota* Lederer, *Gibberifera* Obraztsov, *Crocidosema* Zeller, *Lepteucosma* Diakonoff, *Eucosma* Hubner and *Pelochrista* Lederer of tribe Eucosimini have been collected during this investigation. Out of which, two species viz., *Eucosma gundai* sp. nov. and *Rhopobota pseudonaevana* sp. nov. are being reported as new to science and one specie (*Crocidosema plebejana* Zeller) as new to region. Further the reporting of two new species increased the number of species under genus Eucosma from two to three and under genus Rhopobota from one to two in Kashmir and Ladakh region of Jammu & Kashmir.

ACKNOWLEDGEMENTS

We are thankful to Entomology division SKUAST-Kashmir for giving necessary permissions and support. Authors express their sincere gratitude to overseas tortricid moth expert like Dr. John W. Brown (USDA) and Dr. Joseph Razowski, Institute of Systematics and Evolution of Animals, Poland for their valuable publications, suggestions in certain specific issues and cooperation in identification of the moth species.

COMPETING INTERESTS

The authors have declared that no competing interest exists.

REFERENCES

1. Horak, M. (1999). Tortricoidea. In: Handbook of Zoology, Lepidoptera, Moths and Butterflies, V1: Evolution, Systematics and Biogeography (Ed. Kristensen, N.P.). Walter De Gruyter, Berlin, 199-215.
2. Razowski, J. (1999). Tortricidae of Korea; a faunistic and zoogeographical approach (Insecta: Lepidoptera). Shilap Revista de lepidopterología, 27(105), 69-123.
3. Razowski, J. (2003). Tortricidae (Lepidoptera) from Vietnam in the collection of the Berlin museum i. Tortricini. Polskie Pismo Entomology, 72, 161-175.
4. Liu, Y. Q. and Li, G. W. (2002). Lepidoptera, Tortricidae. In Editorial Committee of Fauna Sinica (ed.), Fauna Sinica (Insecta), 27, 463.
5. Ganai, M. and Khan Z. (2018). Taxonomic Studies on the Tribe- Archipini (Lepidoptera: Tortricidae) from Kashmir Himalaya, India. Annual Research & Review in Biology, 27(2), 1-16.
6. Common, I. F. B. (1970). Lepidoptera (Moths and butterflies) in the insect of Australia, Melbourne University Press, Melbourne, 1-866.
7. Zimmerman, E. G. (1978). Microlepidoptera II: Gelechioidea. In: Insects of Hawaii (Ed. E.G. Zimmerman). The University Press of Hawaii, Honelulu, 9, 883-1903.
8. Robinson, G. S. (1976). The preparation of slides of Lepidoptera genitlia with special reference to Microlepidoptera. Entomologist's Gazette, 27, 127-132.
9. Bradley, J. D., Tremewah, W. G. and Smith, A. (1979). British tortricid moths. Tortricidae: Olethreutinae, the ray society publications, 1-43.

 © 2020 Society of Education, India

10. Razowski, J. (2006). Tortricidae (Lepidoptera) from Kashmir and Ladakh. Acta Zoologica Cracoviensia, 49(1-2), 115-135.
11. Diakonoff, A. (1964). Further records and descriptions of the species of Bactra Stephens (Lepidoptera, Tortricidae). Zoologische Verhandelingen Rijksmuseum van Natuurlijke Historie (Leiden), 70, 1-81.

Copyright: © 2020 Society of Education. This is an open access article distributed under the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.