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Two Newly Recorded and Two Little Known Species of Erebidae (Lepidoptera, Noctuoidea) in Korea

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ABSTRACT

Two genera and two species of the family Erebidae, which is the largest family in Noctuoidea after recently redefined, are newly recorded in Korea: *Luceria striata* Galsworthy and *Metachrostis sinevi* Matov et Kononenko. In addition, supplementary collecting data are provided for the two species of Erebidae, *Lophomilia nekrasovi* Kononenko et Behounek and *Acontia martjanovi* (Tschetverikov), whose Korean distribution has been briefly reported. The female genitalia of *Luceria striata* are described for the first time. Photos of imagines and genitalia, where available, are provided. All the examined specimens are deposited in the Department of Plant Medicine, Chungbuk National University in Cheongju, Korea.

Keywords: taxonomy, new record, Hypenodinae, Eublemminae, Hypeninae, Acontinae

INTRODUCTION

Erebidae is one of four quadrifid noctuoid families recently redefined by Zahiri et al. (2011) and Zaspel et al. (2012). A clade corresponding to Erebidae was first recognized by a molecular study (Mitchell et al., 1997). Later, Fibiger and Lafontaine (2005) verified the monophyly of Erebidae in terms of morphology but retained Arctiidae and Lymantriidae as separate families. These two groups were readjusted as erebid subfamilies in the latest phylogeny of Noctuoidea (Zahiri et al., 2011), and by van Nieukerken et al. (2011). Erebidae, as currently defined, comprises 1,760 genera and 24,569 species (van Nieukerken et al., 2011), representing the largest family of the Lepidoptera.

There exists no previous estimate of species diversity for the Korean erebids. Kononenko and Han (2007) critically updated the Korean Noctuidae *auct* but arranged the species according to Lafontaine and Fibiger (2006) which had merged Nolidae and Erebidae into Noctuidae. Kononenko and Han (2007) also did not consider Arctiinae and Lymantriinae in their catalogue. Recounted by the latest classification (Zahiri et al., 2011), the total number of the Korean erebid species postulated in Kononenko and Han (2007) is 474, assigned to 15 subfamilies. The Korean fauna of Erebidae has not been explored throughout yet, as species which are new to the country are continuously identified (e.g., Choi, 2008, 2009, 2010; Kim et al., 2010; Choi and Lee, 2011).

The purposes of this paper is to report two erebid genera and species new to Korea, to describe the female genitalia of *Luceria striata* Galsworthy for the first time, and to verify the distribution of two little known erebids in Korea.

MATERIALS AND METHODS

Specimens were dissected for genitalia, following the method of Clarke (1941), except that chlorazol black was used for staining, and specimen dissections were mounted on microslides in euparal resin. Pinned specimens were examined under a Leica MZ APO stereo zoom microscope (Leica, Wetzlar, Germany), and slide-mounted specimens under a Leica LEITZ-DMRX compound microscope. Photos of adults were made with a Nikon D40 DSR camera (Nikon, Tokyo, Japan). Genital images were captured using the VDBK digital imaging systems, adopted by the United States Department of Agriculture and installed in the Department of Entomology, USNM. Terminology for genitalia follows that of Klots (1970). All examined specimens are deposited in the Department of Plant Medicine, Chungbuk National University, Cheongju, Korea.

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SYSTEMATIC ACCOUNTS

Genera and species new to Korea

Order Lepidoptera
Family Erebidae

***Luceria* Walker, 1859**

Luceria Walker, 1859: 853.
Type species: *Luceria novatusalis* Walker, 1859, by original designation.

Luceria is one of seven genera belonging to the erebid subfamily Hypenodinae (Kononenko, 2010) which was defined by a homoplasious characteristic, the loss of ocelli (Fibiger and Lafontaine, 2005). The genus is similar to two predominantly Palearctic genera, *Hypenodes* Doubleday and *Schrankia* Hübner, in having narrow forewings with oblique fasciation, angled postmedian line in the distal half (Holloway, 2008).

Luceria and *Schrankia*, however, differ from *Hypenodes* in having a series of processes across the valva from the sacculus to the costa; the processes are placed more distally in *Luceria* than in *Schrankia* (Holloway, 2008). Further characterization of *Luceria* can be found from Holloway (2008).

Luceria currently comprises 15 species, most of which are localized in the Old World tropics. Five species were described from New Guinea by Rothschild, and were retained under *Luceria* by Poole (1989), but were later excluded from the genus by Holloway (2008). *Luceria* is first introduced to the Korean fauna. This record represents the northernmost distribution of the genus.

[1*]***Luceria striata* Galsworthy, 1997**
(Korean name: sae-wu-zzal-leum-na-bang)
(Figs. 1A, 2A, B, 3A)

Luceria striata Galsworthy, 1997: 133 (type locality: China, Hong Kong, Victoria Peak).

Material examined. Korea: 1♂, Chungbuk Prov., Cheongju, Heungdeok, Sannam-dong, Mt. Guryongsan, 26 Aug 2005, Sohn JC, by bucket trap, SJC-381; 1♀, Gyeongnam, Isl. Geojae-do, Jangmok, Jangmunpo-weaseong (castle), 34°59′30.8″N, 128°40′25.2″E, 18 Jun 2004, Sohn JC, by light trap, SJC-743.

Diagnosis. This species is superficially similar to *Luceria fletcheri* Inoue, an endemic to Japan, but differs from the latter in having the paler ground color and a broader brownish white band juxtaposed to the postmedian line in the forewings; by the presence of the costal process, the broader vinculum, and the slender phallus in the male genitalia; the narrow antrum and the globular corpus bursae in the female genitalia.

Redescription. Head (Fig. 1A): Vertex and frons brownish white, sparsely intermixed with dark brown scales. Antennae filiform, pubescent ventrally in both sexes; scape brownish white, intermixed with a few dark brown scales; flagellomeres brownish white dorsally, naked ventrally. Labial palpi oblique upward, 3rd segment upcurved; 1st segment broadened to apex, 1/5 as long as 2nd segment, dark brown on exterior surface, brownish white on interior surface; 2nd segment dark brown on exterior surface, brownish white on interior surface, with shallow-triangular, pale brown scale tuft dorsally; 3rd segment 1/4 as long as 2nd, acuminate apically, dark brown, with brownish white ring apically and basally. **Thorax (Fig. 1A):** Patagium and tegula pale yellow, intermixed with dark brown scales exterolaterally; mesonotum brownish white, sparsely intermixed with dark brown scales. Fore- and mid-legs dark grayish brown dorsally, brownish white ventrally. Hindlegs brownish white, intermixed with pale brownish gray scales in distal 1/3 of femur. Forewing length 6.5–6.8 mm (n=2) elongate-triangular, brownish white, peppered with dark brown scales denser along costal and outer marginal areas and between ante- and postmedian lines, termen broadly round in anterior 2/3; antemedian line dark brown, oblique in posterior 1/3, intermittent, curved in anterior 2/3; median line as an oblique, dark brown bar near costa; discal spot small, dark brown; postmedian line dark brown, nearly straight, oblique toward apex; submarginal shade triangular broadened to tornus; terminal dashes black; fringe dark brown. Hindwing pale brownish gray; marginal line dark brown; fringe pale yellowish gray in basal 1/2, dark brownish gray in distal 1/2. **Male genitalia (Fig. 2A, B):** Uncus 2/5 as long as tegumen, triangular in basal half, slender in distal half. Tegumen narrow, inverted U-shape. Valva narrow-triangular in basal 3/5; cucullus elliptical, with setose, semicircular emargination basoventrally; costal process arising from base, sinuous, band-like, with slender, curved, clubbed process subapically, looped with saccular process distally; sacculus entirely covering the basal 1/3 of valva, broadened medially, with curved, digitate bulge in distal half; saccular process at distal end of sacculus crescentiform, with one long and one short digitate lobes. Juxta inverted spade-shape. Vinculum narrowly diverging to tegumen; saccus clypeiform. Phallus slender, nearly straight, coecum broadened; vesica elongate, with a small, dentate cornutal zone basally. **Female 7th sternite and genitalia (Fig. 3A):** Sternite VII triangular. Papillae anales subtrapezoidal. Apophyses posteriores as

Korean name: [1*]새우짤름나방 (신칭)

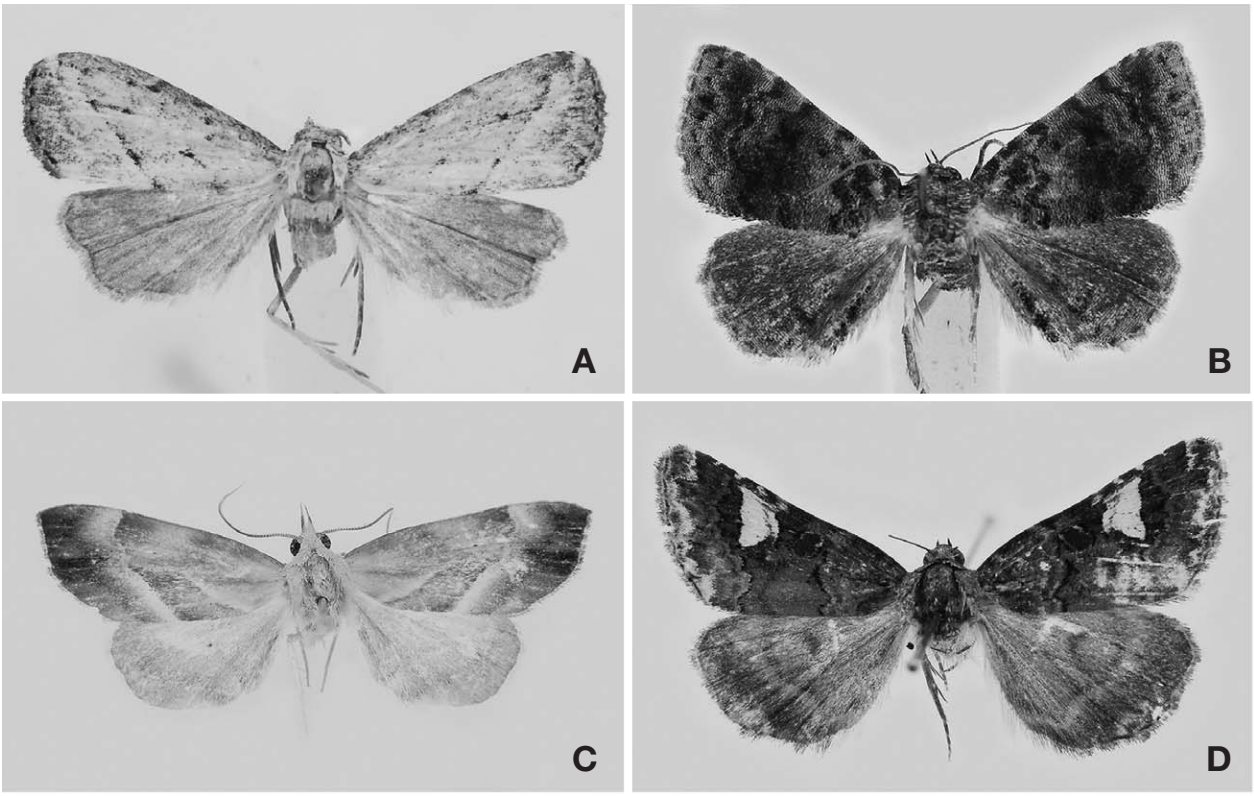

Fig. 1. Adults. A, *Luceria striata* Galsworthy, female; B, *Metachrostis sinevi* Matov et Kononenko, female; C, *Lophomilia nekrasovi* Kononenko et Behounek, male; D, *Acontia martjanovi* (Tschetverikov), male.

long as papillae anales. Ostium bursae beyond the posterior end of 7th sternite. Ductus bursae narrow, 5× longer than corpus bursae, broadened at posterior 1/3 and anterior 1/4, sclerotized in posterior 1/4 (antrum). Corpus bursae globular. **Distribution.** South Korea and China (Hong Kong).

***Metachrostis* Hübner, 1816 [1820]**

Metachrostis Hübner, 1816 [1820]: 104.

Type species: *Noctua velox* Hübner, [1813], by subsequent designation by Hampson (1894: 325).

= *Leptosia* Guenée, 1841: 225. Type species: *Noctua velox* Hübner, [1813], by subsequent designation by Guenée (1852: 237). A junior homonym of *Leptosia* Hübner, 1818 (Lepidoptera: Pieridae).

= *Neoleptosia* Koçak, 1980: 38. An unnecessary replacement name for *Leptosia* Guenée, 1841.

This genus belongs to Eublemminae (Kononenko and Matov, 2009). Among eublemmine genera, *Metachrostis* is close to *Eublemma* in having a long, slender uncus in the male genitalia and a bowl-shaped antrum in the female genitalia, but differs from the latter by the lack of a digitus and clasper-harpe complex in the male valvae and the coecum extended flat in the phallus, and in having small papillae anales in the female genitalia. Detailed generic descriptions for *Metachrostis* can be found from Kononenko and Matov (2009) and also from Kononenko (2010).

Metachrostis is comprised of 21 species, predominantly occurring in the Palearctic Region (Kononenko and Matov, 2009). Most of them are associated with arid or semiarid habitats. The only known host plants in the genus are for *M. dardouini* (Boisduval) and *M. decora* (Walker) and all belong to Asparagaceae (Forster and Wohlfahrt, 1971; Pinhey, 1975). This genus is recorded from Korea for the first time.

[1]***Metachrostis sinevi* Matov et Kononenko, 2009**
(Korean name: mung-dduk-nal-gae-zzal-leum-na-bang)
(Figs. 1B, 3B)

Metachrostis sinevi Matov et Kononenko in Kononenko et Matov, 2009: 11 (type locality: Russia, Primorye territory, Sukhanovka).

Korean name: [1]*뭉뚝날개짧름나방 (신칭)

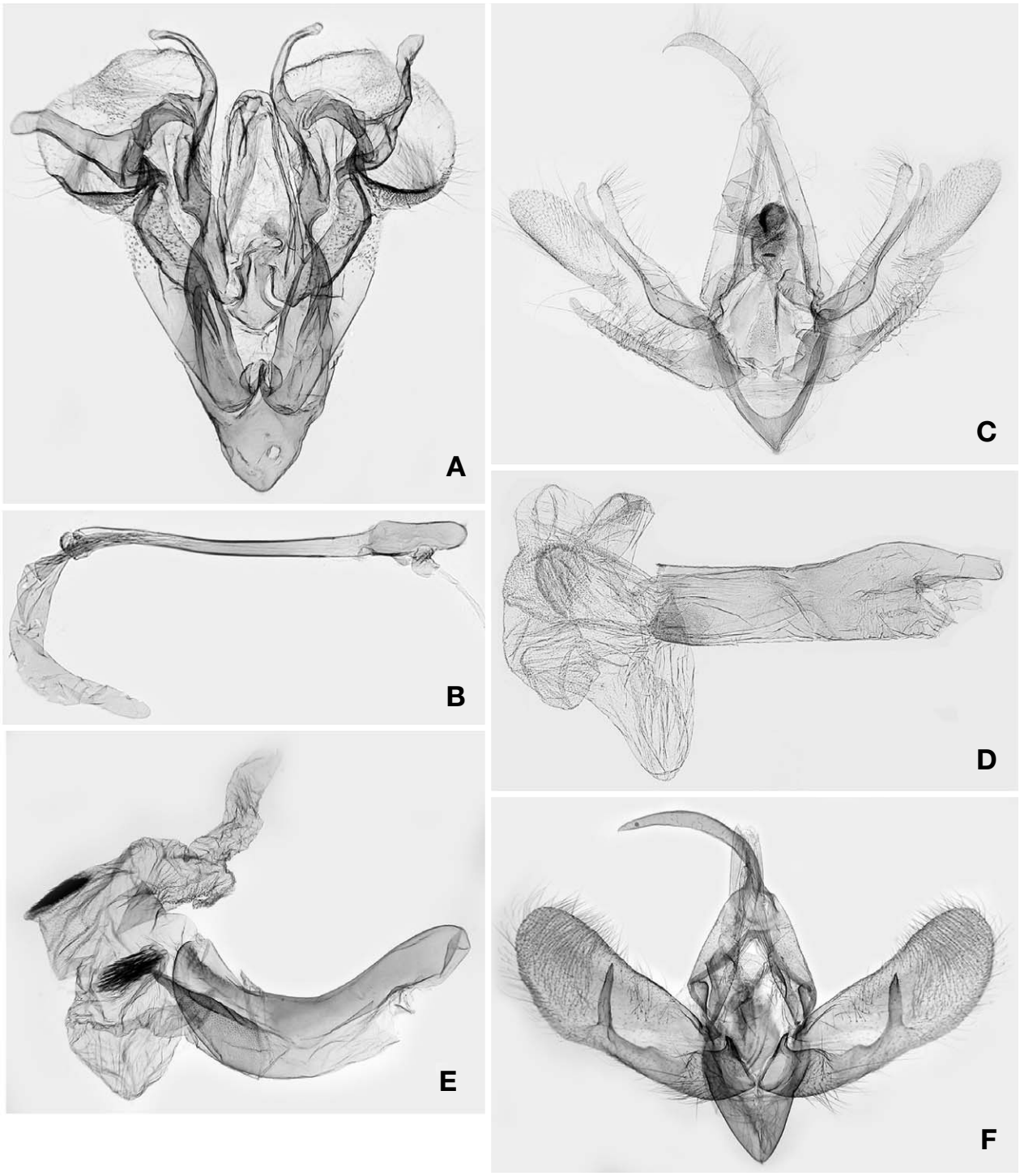

Fig. 2. Male genitalia (B, D, E, phallus). A, B, *Luceria striata* Galsworthy; C, D, *Lophomilia nekrasovi* Kononenko et Behounek; E, F, *Acontia martjanovi* (Tschetverikov).

Material examined. Korea: 1♀, Chungbuk Prov., Cheongju, Heungdeok-gu, Mt. Guryongsan, 29 Jun 2005, Sohn JC, SJC-748.

Diagnosis. Among the Korean erebids, *Metachrostis sinevi* is similar to *Mataeomera esbiahni* Sohn et Ronkay in its external appearance but differs from the latter in having darker

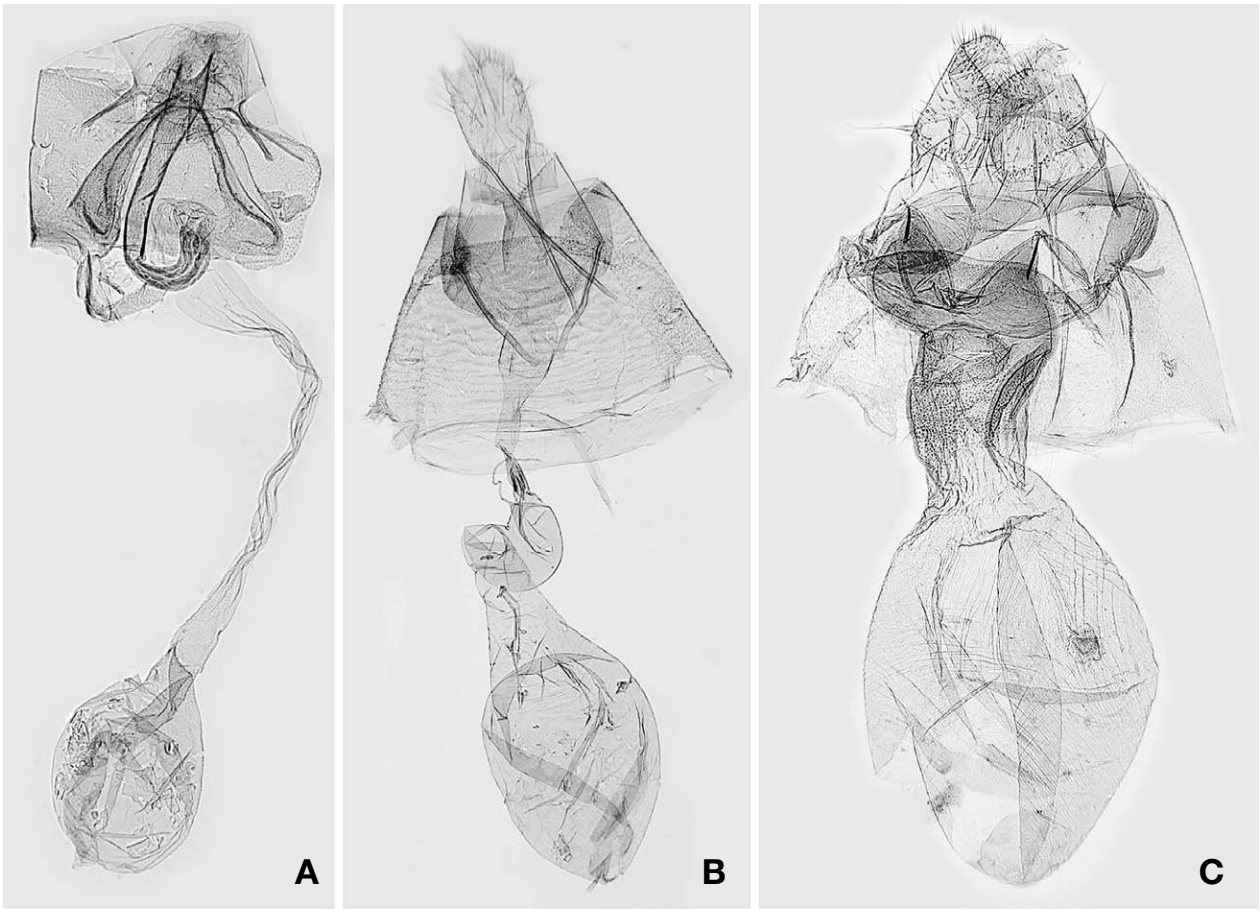

Fig. 3. Female genitalia. A, *Luceria striata* Galsworthy; B, *Metachrostis sinevi* Matov et Kononenko; C, *Lophomilia nekrasovi* Kononenko et Behounek.

wing coloration, especially in its uniformly dark hindwings, the overall structures of male valvae, and the narrower ductus bursae in the female genitalia.

Description. Kononenko and Matov (2009) provided a detailed description for *M. sinevi*, based on both sexes.

Distribution. South Korea and Russia (Far East).

Species little known in Korea

[1]****Lophomilia nekrasovi* Kononenko et Behounek, 2009**
(Korean name: buk-bang-jul-zzal-leum-na-bang)
(Figs. 1C, 2C, D, 3C)

Lophomilia sp.: Kononenko, 2005: 63.

Lophomilia nekrasovi Kononenko et Behounek, 2009: 10 (type locality: Russia, Slavyanka).

Material examined. Korea: 1♂, Chungbuk Prov., Gaeteojae, 31 Jul 2001, Cho S, Lyu DP, Nam S; 1♂, Gyongnam Prov., Gimhae-gun, Saengrim-myeon, Yeocha-ri, Yongsan Elementary School, 14−15 Aug 1987, paratype of *L. nekrasovi*; 1♀, Gyongnam Prov., Masan-si, Habpo-gu, Jinjeon-ri, Yeoyang-ri, Mt. Yeohangsan, Osil-gol, 12−13 Jun 1999, Ahn TH.

Diagnosis. *Lophomilia nekrasovi* is similar to *L. polybapta* (Butler) in the superficial appearance but is distinguished from the latter in having the smooth postmedian line (waved in *L. polybapta*) and the broader median transverse band in the forewings; the longer clasper-harpe complex in the male valvae; and the wider antrum in the female ductus bursae.

Description. The habitus and genitalia of *L. nekrasovi* were described and illustrated by Kononenko and Behounek (2009).

Distribution. South Korea, China (North), and Russia (Far East).

Notes. Kononenko and Behounek (2009) mentioned one male

Korean name: [1]*북방줄짤름나방 (신칭)

paratype from our collection. Since they did not give any detail about the specimen, it is impossible to find out which of the aforementioned specimens they referred to. Here, one male collected on 14−15 Aug 1987 is defined as the paratype.

[1]***Acontia martjanovi*** **(Tschetverikov, 1904)**
(Korean name: sa-gu-ggo-ma-bam-na-bang)
(Figs. 1D, 2E, F)

Erastria martjanovi Tschetverikov, 1904: 78 (type locality: Russia, Minusinsk).
Lithacodia martjanovi: Warren, 1912: 279.
Lithacodia martjanovinovi (sic): Hua, 2005: 231.
Acontia martjanovi: Kononenko, 2010: 141.

Material examined. Korea: 2♂, Chungnam Prov., Taean, Wonbuk, a sand dune near Sindu-ri, 3 Jun 2003, Sohn JC, SJC-318; 3♂, ditto, 21 Sep 2004, Sohn JC.

Diagnosis. This species is clearly distinguished from other congeners in Korea by having a large, white reniform stigma in dark brown forewings. In the male genitalia, *Acontia martjanovi* is close to *Acontia trabealis* (Scopoli) but differs from the latter in the lack of harpe in both valvae and the round apex of valvae (truncate in *A. trabealis*).

Description. Head brownish white. Antennae 3/5 as long as forewing. Labial palpi dark grayish brown, with a brownish white ring at end of second segment. Thorax with patagium, tegula, and mesonotum brownish white, intermixed with dark grayish brown scales; mesoscutellum with reddish brown scale tuft. Legs dark grayish brown; tibia and tarsomeres with brownish white ring distally. Forewings dark grayish brown; subbasal and antemedian, and postmedian line black, waved, juxtaposed with pale brown band; median area pale grayish brown; subterminal line pale yellowish brown, zigzagged; terminal dashes black, juxtaposed with pale yellowish brown dashes; orbicular stigma dark gray; reniform stigma white. Hindwing dark yellowish brown; marginal shade dark grayish brown. Abdomen dark brown, intermixed with pale yellow scales. Male genitalia with uncus elongate, curved; valvae elongate, round apically; harpe straight, at distal end of sacculus; vinculum narrowly diverged, narrowly round anteriorly; phallus curved; vesica with two spinulate cornutal zones. See Kononenko (2010) for the female genitalia.

Distribution. South Korea, China (Heilongjiang, Inner Mongolia), Mongolia, and Russia (South Siberia).

Notes. Kononenko (2010) included 'S Korea' in the distribution of this species without giving any specimen record. This species is known as xerophilous (Kononenko, 2010). In Korea, *Acontia martjanovi* appears exclusively associated with coastal sand dune habitats.

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