

# Three Newly Reported Species of the Subfamily Olethreutinae (Lepidoptera: Tortricidae) in Korea

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## ABSTRACT

In this study, three species of the subfamily Olethreutinae; *Matsumuraeses ussuriensis* (Caradja, 1916), *Pseudacroclita luteispecula* (Kuznetsov, 1979) and *Zeiraphera hiroshii* Kawabe, 1980 are reported for the first time from Korea. All species descriptions in this study are based on data obtained through the collection and rearing of larvae. This research is expected to make a significant contribution to the understanding of the ecological characteristics of this family. Descriptions, biological information, host plants, high-resolution photographs of larvae, adults, and genitalia are provided for each species. Additionally, host plants for some species were reported for the first time in this study.

**Keywords:** Olethreutinae, new record, biological information, Korea

## INTRODUCTION

The subfamily Olethreutinae, with over 4,400 species recorded globally and more than 260 species in Korea (Gilligan et al., 2010; Park and Lee, 2021), is a relatively large taxonomic group. This study is based on data obtained by rearing larvae collected in Korea. In this study, we report three newly recorded species of Olethreutinae, *Matsumuraeses ussuriensis* (Caradja, 1916), *Pseudacroclita luteispecula* (Kuznetsov, 1979), and *Zeiraphera hiroshii* Kawabe, 1980, from Korea.

Redescriptions, photographs of larvae, adults and genitalia, biological information and host plants are provided for each species for the first time in Korea. In the present study, the host plants of *P. luteispecula* (Kuznetsov, 1979) and *Z. hiroshii* Kawabe, 1980 have been reported for the first time in the world.

## MATERIALS AND METHODS

All species used in this study were collected from various locations in Korea and reared to record their biological information. Adults were photographed using a digital camera (Canon

EOS 550D, Japan). Genitalia dissections followed the method of Holloway et al. (1987) and were performed under a dissecting microscope (Nikon SMZ445, Japan). Genitalia slides were photographed using a digital camera attached to a microscope (LEICA M205C; Leica Microsystems, Wetzlar, Hesse, Germany).

Currently, adult and genitalia slide are deposited in the Systematic Entomology Laboratory, Hannam University, Daejeon, Korea (HNSUEL).

The abbreviations used in this study are as follows: Gangwon-do (GW), Jeollanam-do (JN).

## SYSTEMATIC ACCOUNTS

Order Lepidoptera Linnaeus, 1758  
Family Tortricidae Latreille, 1803  
Subfamily Olethreutinae Walsingham, 1895

Genus *Matsumuraeses* Issiki, 1957  
*Matsumuraeses* Issiki, 1957. Type species. *Semasia phaseoli* Matsumura, 1900.

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**Fig. 1.** Adults. A, *Matsumuraeses ussuriensis*; B, *Pseudacroclita luteispecula*; C, *Zeiraphera hiroshii*. Scale bars: A-C=2.0 mm.

<sup>1</sup>\**Matsumuraeses ussuriensis* (Caradja, 1916)

*Ancylis latipennis* var. *ussuriensis* Caradja, 1916: 71.

*Matsumuraeses monstruosana* Kuznetsov, 1962: 346.

*Matsumuraeses ussuriensis* (Caradja): Razowski, 1971: 496.

**Material examined.** Korea: [GW], 1 ♀, Chuncheon-si, Sindong-myeon, Mt. Geumbyeongsan, 30 Jul 2023 (leg. UH Heo), genitalia slide no. HNUSEL-1272 coll. HNUSEL; 1 ♀, Yangpyeong-gun, Bisol-gogae, 30 Aug 2015 (leg. UH Heo), genitalia slide no. HNUSEL-1273 coll. HNUSEL.

**Adults** (Fig. 1A). Wingspan 13 mm. Head dark brown; antennae blackish dorsally and light brown ventrally. Thorax covered with grayish-brown scales. Forewing ground color yellow ochreous with scattered dark brown scales, and whitish distally; outer margin has a sharply protruding apex; six black spots along the apex, with the second and third spots from the outer edge located further outward than the other spots. Hindwing ground color yellow ochreous.

**Male genitalia.** Unknown.

**Female genitalia** (Fig. 2A). Papillae anales long and oval-shaped, tapering toward the base, and covered with long

setae. Apophyses anteriores same length as the apophyses posteriores. Ostium bursae broad funnel-shaped with sclerotized edges. Ductus bursae 1.2 times longer than apophyses anteriores, narrow, membranous near the ostium bursae and corpus bursae respectively, except strongly sclerotized middle area. Corpus bursae large and oval. Two different sized signa, showing hook-shaped with a slightly curved near apex, located laterally, in the central part of the corpus bursae.

**Larvae.** Head and thorax are orange. Abdomen pale creamy yellow (Fig. 3A).

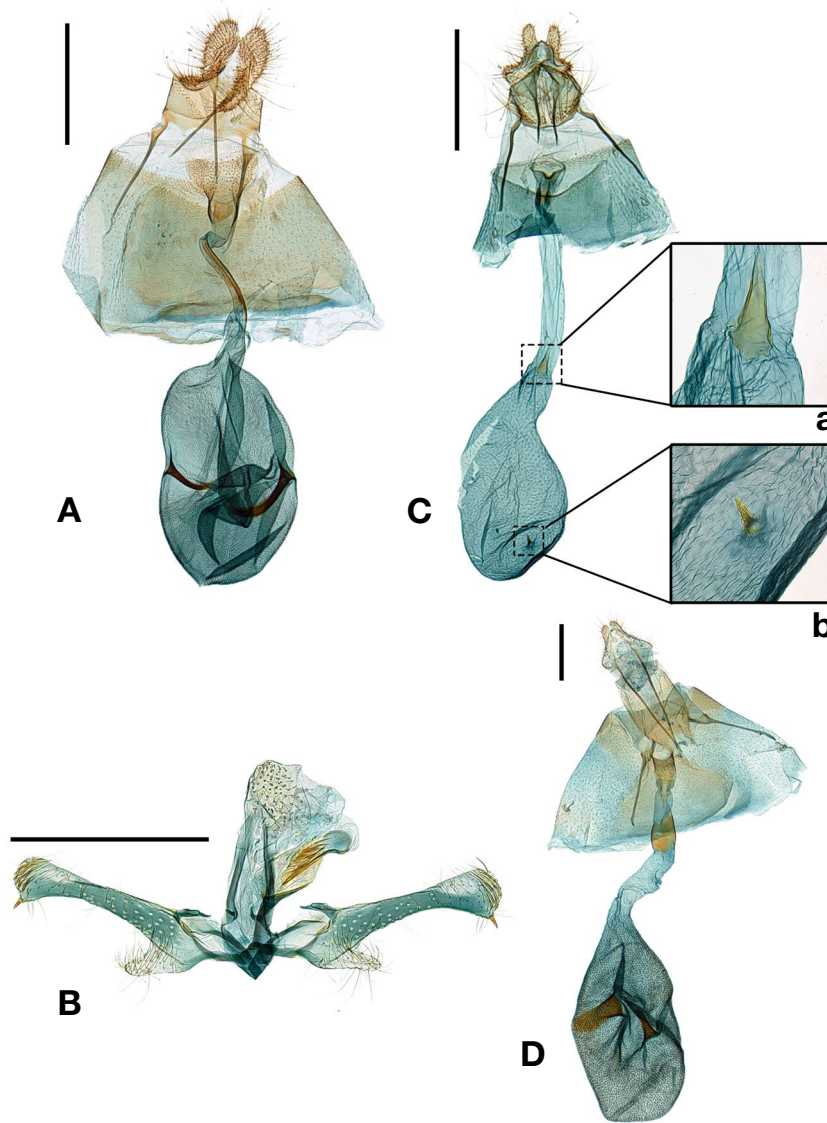
**Distribution.** Korea (new record), China (Anhui), Japan, Russia.

**Host plants.** *Glycine max* (L.) Merr [Fabaceae], *Pueraria lobata* Ohwi [Fabaceae], *Wisteria floribunda* (Willd.) D.C [Fabaceae] (Lv and Li, 2007).

**Biology.** The larvae live by folding and attaching young leaves and pupate within the folded leaves (Fig. 3A, B). Summer larvae emerge as adults about two weeks later, while autumn larvae emerge the following year.

**Remarks.** This species was collected and reared from *Pueraria lobata* in this study.

Korean name: <sup>1</sup>\*췘나방 (신칭)



**Fig. 2.** Male and female genitalia. A, *Matsumuraeses ussuriensis*, ♀; B, *Pseudacroclita luteispecula*, ♂; C, ditto, ♀; a, magnification of triangular sclerotized part; b, magnification of signum; D, *Zeiraphera hiroshii*, ♀. Scale bars: A–D=0.5 mm.

Genus *Pseudacroclita* Oku, 1979

*Pseudacroclita* Oku, 1979. Type species. *Acroclita hapalaspis* Meyrick, 1931.

<sup>1</sup>\**Pseudacroclita luteispecula* (Kuznetsov, 1979)

*Enarmonodes luteispecula* Kuznetsov, 1979.

*Pseudacroclita luteispecula* (Kuznetsov): Kuznetsov, 2001.

**Material examined.** Korea: [JN], 1♀, Wando-gun, Wando-sumogwon, 4 Oct 2019 (leg. UH Heo), genitalia slide no. HNUSEL-1268 coll; 1♂, Haenam-gun, Daeheungsa-gil, 14

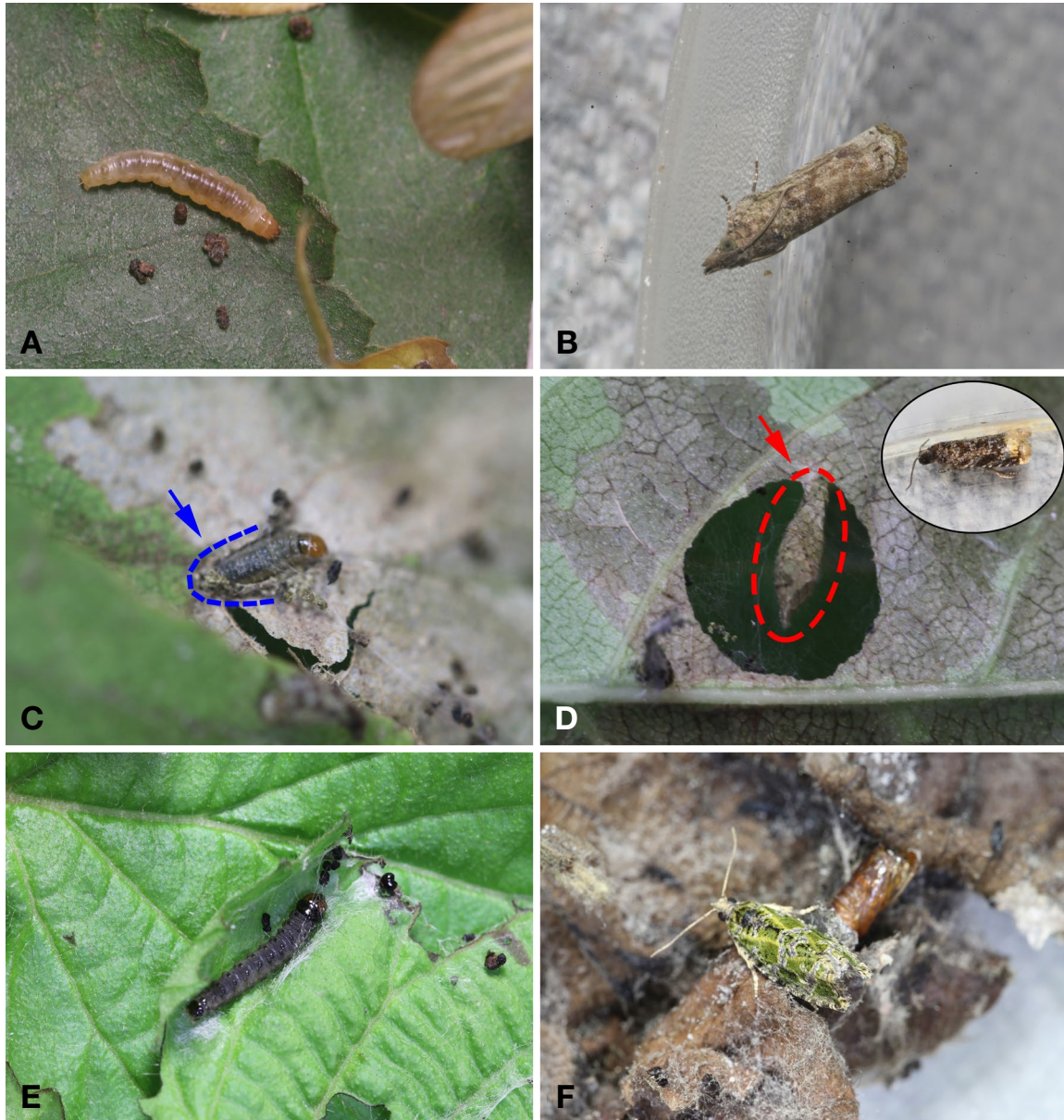
Sep 2019 (leg. UH Heo), genitalia slide no. HNUSEL-1269 coll. HNUSEL.

**Adults** (Fig. 1B). Wingspan 7 mm. Head covered with black scales; antennae slightly yellowish ventrally. Thorax dark black. Forewing ground color black with scattered silvery scales; a large orange spot at the apex with a black zigzag pattern on top; a small, round orange spot at the apex of the outer edge; cilia on the edge are black, and the wing apex orange. Hindwing ground color light gray.

**Male genitalia** (Fig. 2B). Uncus narrow, pointed, and arched. Valva has a narrow center with a rounded bulge at the

Korean name: <sup>1</sup>\*작살나무애기잎말이나방 (신칭)





**Fig. 3.** Larvae of the species. A, Larvae of *Matsumuraeses ussuriensis*; B, ditto, just emerged adult; C, Larva of *Pseudacroclita luteispecula* at opening of the silken tunnel (blue mark: silken tunnel); D, ditto, cocoon in the wrapped leaf of feeding site and emerged adult at right upper (red mark: cocoon); E, Larvae of *Zeiraphera hiroshii*; F, ditto, just emerged adult from its pupa.

apex, featuring 10–12 setae at the apex, and one short, sclerotized spine at the lower margin of the apex. Sacculus short, protruding membrane covered with bristles. Vinculum thick, triangular-shaped membrane. Aedeagus as short as half the length of the valva, thin membrane, and several comb-shaped cornuti.

**Female genitalia** (Fig. 2C, Ca, Cb). Papillae anales narrow, curved, and covered with long setae. Apophyses anteriores thick at the base, tapering distally, and are 2/3 the length of

apophyses posteriores. Ostium bursae lightly hardened and hollow in the middle, with a thickly hardened and membranous apex. Ductus bursae wide, moderate, membranous, and with a triangular sclerotized part near corpus bursae (Fig. 2Ca). Corpus bursae pear-shaped, narrowed near ductus bursae, strigulated, membranous, and a small thorn-shaped signum near apex (Fig. 2Cb).

**Larvae.** Head orange; thorax brown with black; abdomen light greenish-brown, and the pinacula white (Fig. 3C).

**Distribution.** Korea (new record), China, Russia.

**Host plants.** *Plectranthus glycolyx* Maxim [Lamiaceae] (Zhang and Li, 2005), *Callicarpa mollis* Siebold & Zucc; *C. japonica* Thunb. [Verbenaceae] (in this study).

**Biology.** The larvae feed on leaf tissues between the upper and lower epidermal layers, creating a white silken tunnel on the leaf and attaching frass to it (Fig. 3C). The tunnel opens to both the upper and lower surfaces of the leaf, and the larvae move through it when they sense danger. Several larvae can live in a single leaf. When fully grown, they cut out a circular piece of the leaf they were feeding on, fold it in half, and make a cocoon (Fig. 3D). The cocoon then falls and overwinters in the leaf litter.

**Remarks.** This species was collected and reared from *C. mollis* and *C. japonica* in this study.

Genus *Zeiraphera* Treitschke, 1829

*Zeiraphera* Treitschke, 1829. Type species. *Tortrix corticana* Denis & Schiffmüller, 1775.

<sup>1</sup>\**Zeiraphera hiroshii* Kawabe, 1980

*Zeiraphera hiroshii* Kawabe, 1980.

**Material examined.** Korea: [JN], 1♀, Gurye-gun, Mt. Osan, 16 Apr 2019 (leg. UH Heo), genitalia slide no. HNUSEL-1314 coll. HNUSEL.

**Adults** (Fig. 1C). Wingspan 16 mm. Head covered green scales with white tips; antennae bright ivory, gradually turning green toward the apex. Thorax covered in green and black scales. Forewing ground color dark green with sparse black spots, two silver-gray stripes running from the costal margin to the hind margin; the first stripe at the 1/3 point with a center curved outward, and the second stripe at the 2/3 point with ends extending outward; costal margin alternately black and white, and hind margin thick black at 1/3 basal. Hindwing ground color light dark gray.

**Male genitalia.** Unknown.

**Female genitalia** (Fig. 2D). Papillae anales narrow, curved, slightly thickened basally. Apophyses anteriores thin, and long. Apophyses posteriores triangular, thick at the base, tapered at the apex, and 2/3 the length of the apophyses anteriores. Ostium bursae cylindrical, and strongly sclerotized. Ductus bursae wide and sclerotized at the midpoint. Corpus bursae oval-shaped, with a thick and rough surface membrane. Signum rod-shaped with blunt, swollen apex, and two in the center of the corpus bursae, each of different sizes.

**Larvae.** Head brown; thorax black; abdomen dark gray, and the pinacula black (Fig. 3E).

**Distribution.** Korea (new record), Japan.

**Host plants.** *Viburnum dilatatum* Thunb. [Viburnaceae] (in this study).

**Biology.** The larvae live by folding and tightly attaching leaves and pupated within them (Fig. 3F).

**Remarks.** This species was collected and reared from *Viburnum dilatatum* in this study.

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## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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