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Two species of *Yponomeuta* Latreille, 1796 (Lepidoptera, Yponomeutidae) new to Korea

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The small ermine moth, *Yponomeuta* Latreille, 1796, has distinctive black dotted lines along the forewing veins, which makes species identification challenging. Despite their superficial similarity, a total of 99 species have been described in the world. Among them, 18 species of *Yponomeuta* are reported from Korea to date based on their taxonomic studies. In the present study, we report two species of *Yponomeuta* Latreille, 1796, newly recorded in Korea: *Yponomeuta bipunctella* (Matsumura, 1931) from Gyeonggi-do, Gangwon-do, Jeollanam-do province, and *Y. mayumivorella* (Matsumura, 1931) found only in Ulleung Island, Gyeongbuk Province. The diagnosis, description, photographs of adults and genitalia are provided.

Keywords: distribution, new records, taxonomy

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Introduction

The small ermine moth, *Yponomeuta* Latreille, 1796, belongs to the family Yponomeutidae, which comprises 99 described species worldwide (Lewis and Sohn, 2015; Agassiz, 2019). Among them, 42 species are currently distributed in the Palearctic Region. To date, a total of 18 species of this genus have been reported in Korea by various researchers: Park (1983), Byun and Bae (2003), Sohn *et al*. (2010), Lee and Park (2016), Na *et al*. (2018), and Kim *et al*. (2022).

Recently, Na *et al*. (2018) revised the Korean *Yponomeuta evonymella*-group, recognizing three new valid species: *Y. orientalis* Zagulajev, *Y. padella* Linnaeus, and *Y. refrigeratus* Meyrick. Subsequently, Kim *et al*. (2022) reported the occurrence of *Yponomeuta megunonis* Moriuti in Korea, investigated its biology including the host plant, immature stages, and identified two natural enemies.

This genus can be distinguished from other Yponomeutine species by the following characteristics: (i) antenna filiform, scape with pecten; labial palpus short and porrect; (ii) forewing elongated-ovate, with 12-veined, all seperated, with chorda, R_1, M_3, and CuA_1 short connate; (iii) hindwing M_3 and CuA_1 completely fused, and a hyaline space present beneath cell at the base.

In the present study, we report two *Yponomeuta* species new to Korea: *Y. bipunctella* (Matsumura, 1931) and *Y. mayumivorella* (Matsumura, 1931). The description, photographs of adult and genitalia are provided.

Materials and Methods

The majority of the species are based on the specimens collected from Korea. The specimens were collected using the light traps with a mercury vapor lamp (200 V/200 W, Dongseong Co., Korea) and four UV lamps (20 W, FL20SbL Kumbo Co., Korea). Genitalia were dissected and exam-

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ined under a Leica EZ4 stereo-microscope. Images of adults and genitalia were taken with a Leica M205C (Leica microsystems, Wetzlar, Germany) attached to a Dhyana 400DC CMOS camera (Tucsen photonics, China). The examined specimens are deposited in the Plant Quarantine Technology center, Animal and Plant Quarantine Agency, Gimcheon, Korea. Abbreviations used herein are as follows; GB: Gyeongbuk-do Province; GG: Gyeonggi-do Province; GW: Gangwon-do Province; JN: Jeollanam-do Province; PQTC: Plant Quarantine Technology Center, Animal and Plant Quarantine Agency; TL: type locality; TS: type species.

Taxonomic Accounts

Family Yponomeutidae Stephens, 1829 집나방과
Subfamily Yponomeutinae Stephens, 1829 집나방아과

Genus *Yponomeuta* Latreille, 1796 집나방속

Yponomeuta Latreille, 1796: 417. TS: *Phalaena evonymella* Linnaeus, 1758, by subsequent designation by Latreille, 1802.
Hyphantes Hübner, 1806 [1873]: 2. Suppressed (ICZN Opinion 97).
Erminea Haworth, 1811: 512 [A junior objective synonym].
Hyponomeuta Billberg, 1820: 91 [unjustified emendation of *Yponomeuta*].
Coeniphantes Hübner, 1822: 67 [misspelling of *Coenyphantes*].
Coenyphantes Hübner, 1822: 65 [A junior objective synonym].
Nygmia Hübner, 1825 [1826]: 412 [A junior objective synonym, a junior homonym of *Nygmia* Hübner, 1816. [1820] (Lymantriidae)].
Ypomeneuta Eversmann, 1844: 564 [misspelling of *Yponomeuta*].
Hyponomeneuta Zeller, 1846: 165 [misspelling of *Hyponomeuta*].
Hyponomenta Turner, 1898: 201 [misspelling of *Hyponomeuta*].

***Yponomeuta bipunctella* (Matsumura, 1931) (Figs. 1A, 1B, 2A, 2C, 3A)** 줄사철나무집나방 (신칭)

Hyponomeuta bipunctella Matsumura, 1931, 6000. Ill. Ins. Jap.: 1097. TL: Japan (not given).
Yponomeuta bipunctellus: Moriuti, 1977, Faun. Jap. Ypon. s. l.: 193, f. 64, 277, 428.

Diagnosis. This species is similar to *Y. griseatus* Moriuti, but it differs to absent of irregular patch at base of subradial and apical area of the median cell on the forewing. *Yponomeuta bipunctella* (Matsumura) has unique characters in

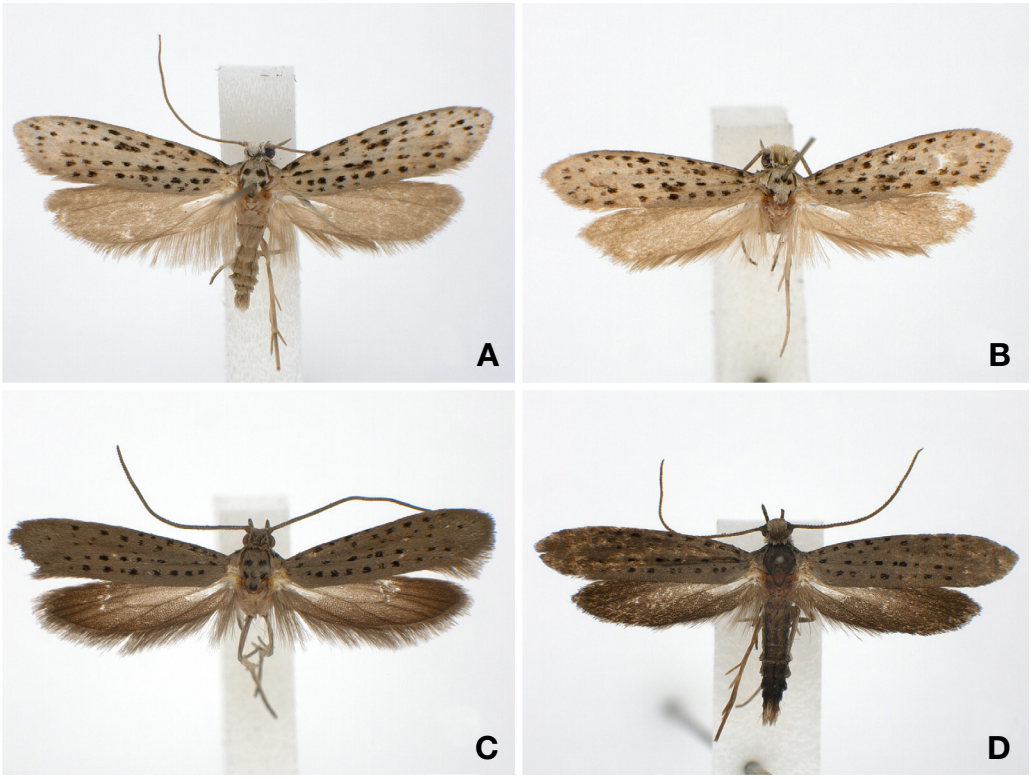

Fig. 1. Adults of *Yponomeuta* spp. A. *Y. bipunctella* (Matsumura), ♀; B. *ditto*, ♂; C. *Y. mayumivorella* (Matsumura), ♀; D. *ditto*, ♂.

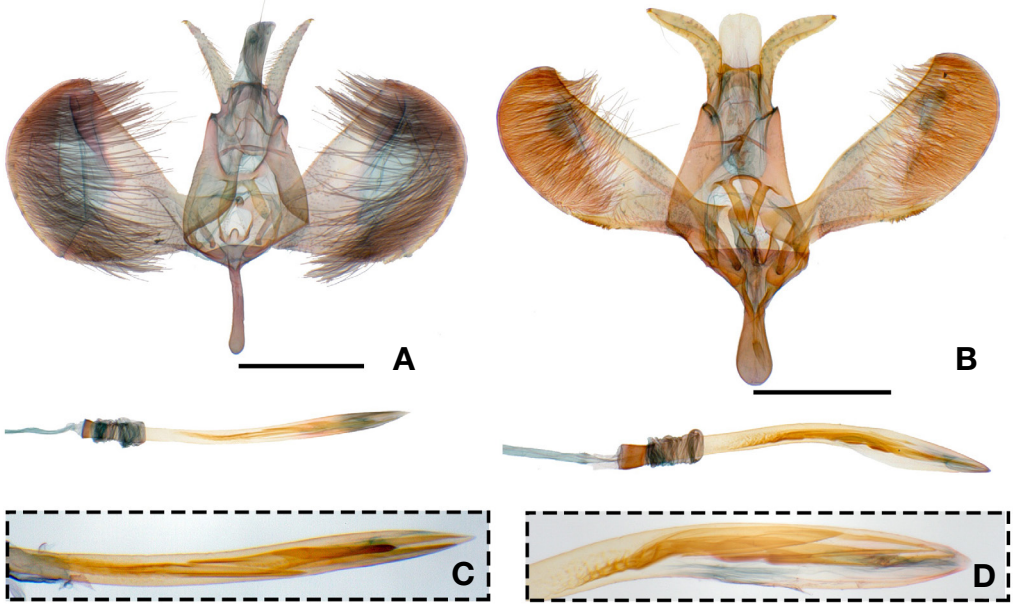

Fig. 2. Male genitalia of *Yponomeuta* spp. **A, C.** *Y. bipunctella* (Matsumura), enlarged aedeagus with cornuti; **B, D.** *Y. mayumivorella* (Matsumura), enlarged aedeagus with cornuti. Scale bars = 0.5 mm.

the male genitalia, triangular valva, gnathal process more elongated in the genitally allied species: *Y. griseatus* Moriuti, *Y. sedellus* Treitschke, and *Y. yanagawanus* (Matsumura).

Description (Fig. 1A, 1B). Wingspan 14−17 mm. Vertex rough and erected gray scales with two black dots-like scales anteriorly, frons gray appressed scales, black scales around compound eye. Antenna filiform, scape gray with white pecten, flagellum gray. Labial palpus porrect, 1st and 2nd segment black brown outwardly, white inwardly, 3rd segment white with gray line near base to 2/3 anteriorly. Foreleg femur to tibia yellow brown outwardly, white inwardly, tarsus yellow brown; midleg femur white, a black dot at apex, tibia gray outwardly, white inwardly with a black dot at middle of tibia outwardly, tarsus gray outwardly, white inwardly; hindleg yellow gray. Thorax gray, one pair of black dots 2/5 anteriorly, another pair of dots 2/3 anteriorly, and one dot at base, tegula gray with a black dot near base. Forewing gray with black line base to 2/3 costal margin, about 49−51 black dots on forewing, viz., 5 subcostal from near base to 1/3, 7 radial near base to near costa at 4/5, 4−5 subradial in R_2, pale dark gray irregular patch near base of subradial, 7 supramedian from 1/3 basal to near termen, 10 submedian from base to tornus, pale dark gray irregular patch at 2/5 of submedian, 9−10 subdorsal near base to before tornus, 3 dots between radial to supramedian, pale dark gray irregular patch near apical area of median cell, 4 dots between supramedian and submedian, cilia pale gray, near apex dark gray. Hindwing and cilia gray. Abdomen gray.

Male genitalia (Fig. 2A, 2C). Uncus little concave at middle and each edge. Socius little curved outwardly, some hair-like setae sparsely with two thorns at apex. Tuba analis membranous. Gnathos a pair of clavate processes without spinules, narrow toward apex. Valva tomahawk-shaped; sacculus not well-defined, long and narrow with some bristles in distal 1/3. Saccus clavate, little dilatate at apex, 1/4 length of aedeagus. Aedeagus about 1.4 times as long as valva, with cornuti composed of four spines with many spinules anteriorly. Coremata well-developed.

Female genitalia (Fig. 3A). Papillae anales semioval with hair-like setae. Intersegmental membrane between papillae anales and 8th segment about half length of 8th segment. Apophyses anteriores branched and as long as apophyses posteriores. Lamella postvaginalis produced a pair of semioval pads with erected setae. Ostium bursae ringed, spinulated; antrum sclerotized, funnel-shaped, about 1/8 as long as ductus bursae. Ductus bursae 1.3 times as long as corpus bursae, membranous, with ductus seminalis at 1/5 anteriorly. Corpus bursae oval, without signum.

Distribution. Korea (GG, GW, JN), Japan (Hokkaido, Honshu, Sikoku), Russia (Primorsky).

Host plant. Celastraceae: *Euonymus fortunei* (Trucz.) Hand.-Maz. (Moriuti, 1977).

Specimens examined. [PQTC] [GW] ♂, Mt. Chiak, 12. VII. 1997 (Bae & Ahn), genitalia slide no. INU-4662. [JN] ♀, Mt. Jangan, Namweon-si, 17. VII. 1998 (Bae, Paek, Lee, Ahn, Kim & Song). [GG] ♀, Mt. Hwaya, 18. VII. 1997 (Bae, Paek, Lee, Oh & Ahn), genitalia slide no. INU-4663. [GW] ♀, Mt. Jeombong, 5. VIII. 1997 (Bae & Ahn).

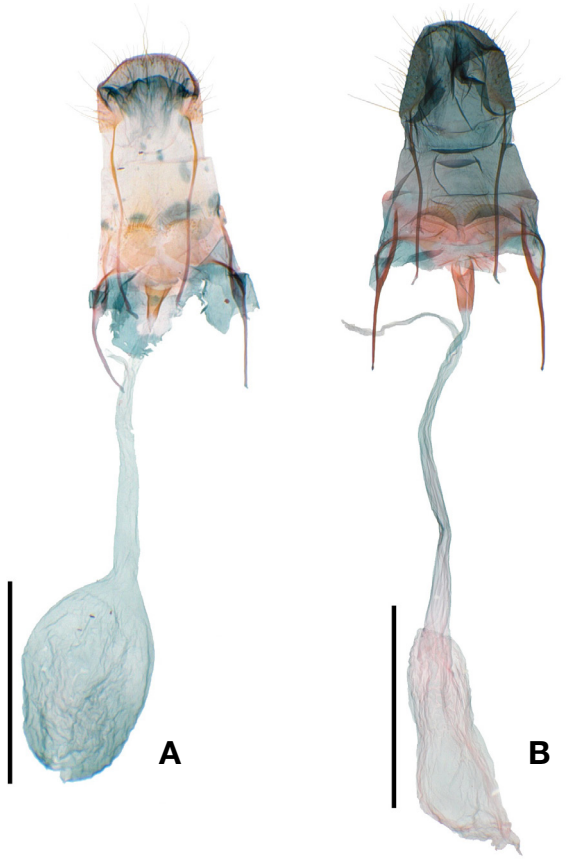

Fig. 3. Female genitalia of *Yponomeuta* spp. A. *Y. bipunctella* (Matsumura); B. *Y. mayumivorella* (Matsumura). Scale bars = 1 mm.

[GW] ♀, Mt. Chiak, Wonju-si, 24. IV. 1998 (Bae, Paek, Lee & Ahn), genitalia slide no. INU-4768. [GG] ♂, Changdeokgung, Seoul-si, 30. VI. 1999 (Bae *et al.*). [GW] ♂, Temple Sinheungsa, Geundeok-myeon, Samcheok-si, 20. VI. 2008 (Kim, Ju & Chae) (abdomen lost).

Remarks. This species is reported for the first time in Korea.

***Yponomeuta mayumivorella* (Matsumura, 1931) (Figs. 1C, 1D, 2B, 2D, 3B)** 회갈색집나방 (신칭)

Hyponomeuta mayumivorella, Matsumura, 1931, 6000. Ill. Ins. Jap.: 1098. TL: Japan (Hokkaido, Sapporo).

Yponomeuta mayumivorella: Inoue, 1954, Check list Lep. Jap. 1: 37; Moriuti, 1977, Faun. Jap. Ypon. s. l.: 191, f. 63, 276, 427.

Diagnosis. This species is superficially similar to *Y. cinefacta* (Meyrick), but it differs to the superficial appearance: absent of supramedian dots on the forewing. *Yponomeuta mayumivorella* (Matsumura) has unique characters in the male genitalia: socius dramatically curved outwardly, narrowed oval valva, gnathal process more elongated.

Description (Fig. 1C, 1D). Wingspan 14−19 mm. Vertex rough and erected gray scales with two black dots anteriorly, frons gray appressed scales, pale ocherous scales around compound eye. Antenna filiform, scape gray with pecten, flagellum gray. Labial palpus porrect, gray and white scales mixed outwardly, white inwardly. Foreleg femur white with a black dot near base, tibia white, irrorated brown gray, tarsus brown gray; midleg femur pale yellow white, tibia to tarsus pale yellow white, irrorated gray; hindleg femur pale yellow white with a black dot near base, tibia to tarsus pale yellow white. Thorax gray, one pair of black dots 2/5 anteriorly, another one pair of dots 2/3 at anteriorly and one dot at base, tegula gray with a black dot near base. Abdomen gray. Forewing gray without black line in costal margin, about 37−39 black dots on forewing, viz., 5 subcostal from near base to 1/3, 7 radial 1/5 base to near costa at 4/5, 3 subradial before R_2, 5 supramedian from 1/3 basal to near termen, 9−10 submedian from base to tornus, 8−9 subdorsal near base to before tornus, cilia gray. Hindwing and cilia gray.

Male genitalia (Fig. 2B, 2D). Uncus convex each edge. Socius dramatically curved outwardly, some hair-like setae sparsely with two thorns at apex. Tuba analis membranous. Gnathos a pair of elongated processes narrow toward apex without spinules, 0.8 as long as saccus. Valva paddle head-shaped, little curved apex inwardly; sacculus defined from base to 2/5 dorsal margin, narrowed with some bristles in distal 1/4. Saccus clavate, dilatate at apex, 1/5 length of aedeagus. Aedeagus about 1.3 times as long as valva, with cornuti composed of four blade-shaped spines posteriorly and many spinules anteriorly. Coremata well-developed.

Female genitalia (Fig. 3B). Papillae anales semioval with hair-like setae. Intersegmental membrane between papillae anales and 8th segment as long as 8th segment. Apophyses anteriores branched and as long as apophyses posteriores. Lamella postvaginalis produced a pair of semioval pads with erected setae. Ostium bursae ringed, spinulated; antrum cylindrical, sclerotized, about 1/7 as long as ductus bursae. Ductus bursae over 1.5 times as long as corpus bursae, membranous, with ductus seminalis at 1/6 posteriorly. Corpus bursae oval, without signum.

Distribution. Korea (GB), Japan (Hokkaido, Honshu).

Host plant. Celastraceae: *Euonymus fortunei* var. *radicans* (Miq.) Rehder, *E. hamiltonianus* ssp. *sieboldianus* (Blume) H. Hara (Gershenson and Ulenberg, 1998).

Specimens examined. [PQTC] [GB] ♀, Naribunji, Ulleung-gun, 22. VI. 2007 (Bae *et al.*), genitalia slide no. INU-4685. [GB] ♂, Is. Dok, Uleung-gun, 23. VI. 2007 (Bae *et al.*), genitalia slide no. INU-4713. [GB] 3♂, Naribunji, Uleung-gun (36°55′18.78″N, 129°16′47.25″E), 17. VII. 2014 (Bae, Park, Na & Lee), genitalia slide no. INU-4686.

Remarks. This species is reported for the first time in Korea.

Conflicts of Interest

The authors of this paper have no affiliation with any interests and are solely responsible for the paper.

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