

New records of three micromoths (Lepidoptera) from Korea

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한국산 미기록 3종의 미소나방에 관한 보고 (나비목: 우묵날개빨나방과, 집나방과, 둥근날개빨나방과)

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ABSTRACT: Three species of micromoths, *Acria emarginella* Donovan, 1806 (Peleopodidae), *Yponomeuta cinefactus* Meyrick, 1935 (Yponomeutidae) and *Depressaria leucocephala* Snellen, 1884 (Depressariidae) are reported for the first time from Korea. These species were collected at their larval stage on the host plants, and reared until their emergence. Images of larvae, pupae, and adults of all species are given, and the male or female genitalia are illustrated.

Key words: New records, Lepidoptera, Peleopodidae, Depressariidae, Yponomeutidae, *Acria emarginella*, *Yponomeuta cinefactus*, *Depressaria leucocephala*

초 록: 본 연구에서는 우묵날개빨나방과(Peleopodidae), 집나방과(Yponomeutidae), 둥근날개빨나방과(Depressariidae)의 3 미기록종(*Acria emarginella* Donovan, 1806, *Yponomeuta cinefactus* Meyrick, 1935, *Depressaria leucocephala* Snellen, 1884)을 우리나라에 처음으로 보고한다. 이 중 우묵날개빨나방과와 둥근날개빨나방과는 국내에서 처음으로 기록되는 과(Family)이다. 본 논문에서는 3종의 미기록종에 대한 애벌레, 번데기의 사진과 성충의 생식기를 제공하였다.

검색어: 미기록종, 우묵날개빨나방과, 둥근날개빨나방과, 집나방과, 신갈우묵날개빨나방, 극동회색집나방, 축둥근날개빨나방

Most of the lepidopterous larvae feed on the living leaves of various plants, including crop plants. Many of the herbivorous insect species are economically important crop pests. However, except for some major pests, most studies have been focused on their adult life-stages, and their larval habitats are poorly known in Korea.

This study was carried out to identify interactions between the larvae and host plants of Lepidoptera insects in the last several years through rearing system. From the results of these

studies, *Acria emarginella* (Donovan, 1806) (Peleopodidae), *Yponomeuta cinefactus* Meyrick, 1935 (Yponomeutidae) and *Depressaria leucocephala* Snellen, 1884 (Depressariidae), are reported for the first time from Korea. At the same time, *Euonymus alatus* (Thunb.) Siebold (Family: Celastraceae) is newly confirmed as a larval host plant for *Yponomeuta cinefactus* Meyrick, 1935. The examined specimens have been deposited in the Insect Museum of Holoce Ecosystem Conservation Research Institution (HECRI), Hoengseong, Gangwon 25257, Korea.

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Material and Methods

Larvae feeding on plants were collected from the early April to the end of October in various localities in Korea, and reared in the laboratory. Freshly collected host plants from their natural biotopes were provided to larvae until they pupated. Collecting dates of the specimens, which were based on the dates of their emergence, were mentioned on their labels, and the dates of their pupation were also mentioned in the biology of the each species. Lee (1998) provides a full list of its host plants.

Taxonomic accounts

Family Peleopodidae 우묵날개빨나방과(신칭)

Acria emarginella (Donovan, 1804) 신갈우묵날개빨나방 (신칭)

(Figs. 1, 2, 2a, 3, 4)

Phalaena emarginella Donovan, 1804. Nat. Hist. Brit. Ins. 11: 90. (TL):Kent.

Amphoritis camelodes Meyrick, 1905. J. Bombay Nat. Hist. Soc. 16: 601.

Acria emarginella Moriuti, 1982, Moths of Japan, part 1: 248, part 2: 205; Sakamaki, 2013: 253.

Diagnosis. Wingspan, 18.0 mm. The species is similar to *A.*

ceramitis Meyrick, 1908, but can be distinguished from the latter by its relatively larger wingspan, pale orange forewing ground color, with an oblique brownish orange streak running from 1/3 of costa to near upper corner of discal cell, whereas the ground color of *A. ceramitis* yellowish brown with no oblique streak.

Male genitalia (Figs. 2, 2a). Characterized by the asymmetric valva: left valva with lanceolate cucullus produced apically and a free spatulate flap at the base of cucullus on costa, and sacculus elongate with round apex; right valva with longer, rod-like cucullus truncated apically, with a triangular free flap, sacculus not developed. Aedeagus stout, as long as basal part of valva, with complex of heavily sclerotized sclerites.

Material examined. 1♂, Mt. Chiag-san, Gangwon Province, August 7, 2011, collected by KW Lee, genital slide no. HL-1/Park.

Distribution. Korea (Gangwon Prov.), China (Henan, Sichuan, Tianjin, Zhejiang), Japan (Honshu), India, Sri Lanka, UK.

Host. A wide range of plants, including *Quercus mongolica* var. *crispula* (Blume) H. Ohashi Bl. and *Quercus mongolica* Fisch. ex Ledeb. (21 species 7 families), have been known as the larval host plants (Mou et al., 2011; Sakamaki, 2013).

Remarks. A larva feeding on *Quercus mongolica* Fisch. ex Ledeb was collected on July 5, 2011 in Mt. Chiag-san, Gangwon Province, Korea. It pupated on July 25, 2011 and emerged on August 7, 2011. The body length of the matured



Figs. 1-4. 1, Adult; 2, Male genitalia; 2a, Ditto, aedeagus; 3, Larva feeding on the leaf; 4, Pupa

larva is approximately 15 mm. Larvae feed on leaves residing inside the net built by them. The pupation usually takes place within the host plant litter. The family Peleopodidae is newly described in Korea. The genus *Acria* Stephens, 1834 (the type-species: *A. emarginella* Donovan, 1804) was first included in the family Cryptolechidae by Fletcher (1929), and then transferred to the subfamily of Oecophoridae by Hodges (1978). Hodges (1998) raised it to a valid family status, Peleopodidae, and this proposal has been widely accepted. Recently, Heikkilä et al. (2013) placed the genus *Acria* in Acriinae, a subfamily of Peleopodidae. Sohn et al. (2015) supported the association of *Acria* with the family Peleopodidae.

Family Yponomeutidae (집나방과)

Yponomeuta cinefacta Meyrick, 1935 극동희색집나방 (신칭)

(Figs. 5, 6a-c, 7, 8)

Yponomeuta cinefacta Meyrick, 1935, in Caradja & Meyrick, Mat. Microlep.-Fauna Chin. Province Kiangsu, Chekiang, Hunan: 89. TL: China, Zhejiang, Mt. Tienmushan

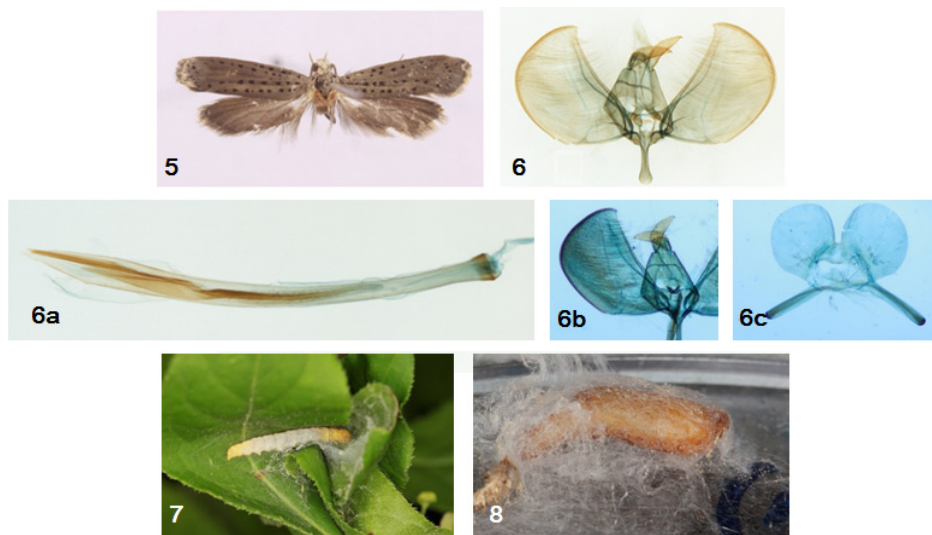
Yponomeuta cinefcata (sic): Meyrick, 1935, in Caradja & Meyrick, Mat. Microlep.-Fauna Chin. Province Kiangsu, Chekiang, Hunan: 89.

Yponomeuta cinefactus: Gershenson, 1985, Ent. Obozr. 64(3): 581.

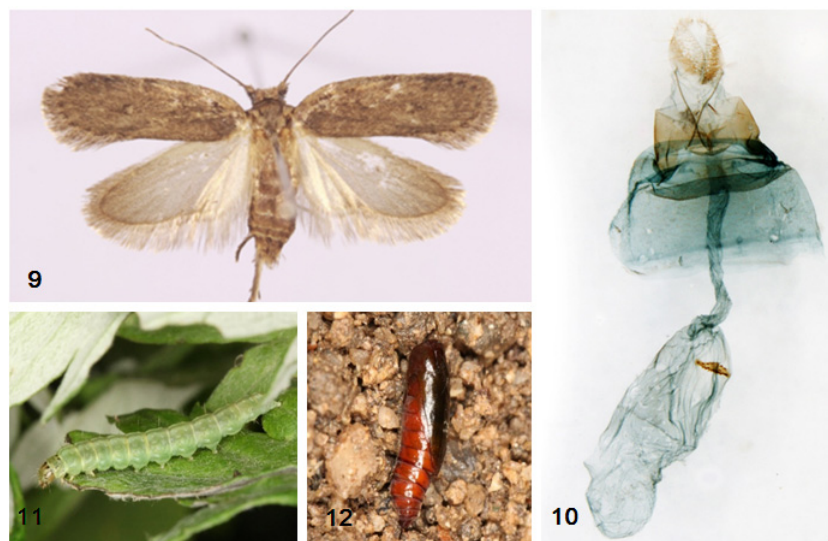
Diagnosis. Wingspan 17.5-18.0 mm. The species is similar to *Yponomeuta anatolicus* Stringer, 1930 or *Y. mayumivorellus* Matsumura, 1931 in superficial appearance, but differs from *Y. anatolicus* having fewer black spots on the radial areas of the forewings and differs from *Y. mayumivorellus* having denser black spots on the forewings. *Y. cinefactus* more clearly distinguished from the latter in the male genitalia: i.e. broader valva, shorter sacculus, and longer phallus. Morphological characters are: Forewing ground color gray, with about 30 black spots, mostly arranged in rows: costal row with 4 spots; subcostal row with 7 spots; cubital row with 8 spots; subdorsal row with 7 spots; subapical area with 3-4 spots; hindwing dark fuscous with transparent hyaline region.

Male genitalia (Figs. 10, 10a-c). Socius falcate, as long as saccus. Gnathal arms digitate, 1/2 as long as saccus. Valva subquadrate, with distal area of costa protruding dorsally; sacculus 1/2 as long as costa, nearly straight, with short triangular expansion at distal end. Saccus bulbous apically, 3/5 as long as sacculus of valva. Phallus slightly curved medially, of nearly even width except apical area; cornutal zone 4/5 length of phallus.

Material examined. 1♂, Hoengseong, Gangwon Province, June 15, 2013, collected by KW Lee, genital slide no. HL-11/Park; 1♂, Hail-ri, Mt. Baegdeog-san, Pyeongchang, Gangwon Province, August 13, 2002, collected by YB Lee,



Figs. 5-8. 5, Adult; 6, Male genitalia; 6a, Ditto, aedeagus; 6b, Ditto, different view of the other specimens genitalia; 6c, Ditto, abdominal segment VIII; 7, Larva feeding on leaves of the host plant; 8, Pupa.



Figs. 9-12. 9, Adult; 10, Female genitalia; 11, Larva feeding on leaves of the host plant, 12, Pupa.

genital slide no. SJC-591.

Distribution. Korea (new record: Gangwon Province), China (Gansu, Hebei, Henan, Jiangsu, Liaoning, Shaanxi, Zhejiang), Russia (Primorsky).

Host. *Euonymus* species (Family: Celastraceae) has been known as larval host plant (Gerhensen & Ulenberg, 1998).

Remarks. Larvae feeding on *Euonymus alatus* were collected on May 14, 2013 in Hoengseong, Gangwon Province, Korea. The host plant *E. alatus* is newly known. The larvae pupated on June 4, 2013 and emerged on June 15, 2013. Larvae tend to form communal webs, and feed inside shelters of the silk-tied folded leaves of the host plant. The pupation usually takes place in the soil or litter.

Family Depressariidae 등근날개빨나방과(신칭)

Depressaria leucocephala Snellen, 1884 쑥등근날개빨나방(신칭)

Depressaria leucocephala Snellen, 1884. Tijds. Ent. 27: 160; Staudinger & Rebel, 1901. Cat. Lep. Pal. Faun., 2: 173; Caradja, 1920. D. Ent. Zeit. Iris, 34: 143; Meyrick, 1925. Gen. Ins. 180: 172; Gaede, 1938-1939. Lep. Cat. 88: 286. TL: Ussuri.

Depressaria thomaniella Rebel, 1917. Verhd. Zool.-Bot. Ges. Wien, 67: 23.

Depressaria urzhumella Krulikowski, 1909. D. Ent. Zeit. Iris, 21: 266

Diagnosis. Wingspan 20 mm. The species is superficially similar to *D. irregularis* Matsumura, 1931, but can be distinguished by the smaller wingspan and by having a distinct white spot in the discal cell of the forewing.

Female genitalia (Figs. 10). Ductus bursae long, slender, as long as corpus bursae. Corpus bursae elongate; signum transversally elongate, width about half of corpus bursae, serrated along margin.

Material examined. 3 ♀, Hoengsung, Gangwon Province, July 7, 2011, collected by KW Lee, genital slide no. HL-13/Park and -23/Park.

Distribution. Korea (Gangwon Province), Japan (Honshu, Hokkaido), Russia, Europe.

Host. *Artemisia princeps* Pampan has been known as a larval host plant (Sakamaki, 2013).

Remarks. Several larvae feeding on *Artemisia princeps* Pampan were collected on June 5, 2011; May 29, 2012; and May 20, 2014 separately. They pupated on June 13, 2011; June 8, 2012; and June 3, 2014, respectively, and emerged on July 7, 2011; June 25, 2012; and June 30, 2014, respectively. The larva is pale green and the head is shiny brown with dark brown stripe. The body length of the larva is approximately 18 mm. The pupation took place in the soil, but it was also pupated in litter or rarely on the leaves of the host plant. The family Depressariidae was newly named in Korea. The genus *Depressaria* was placed in the subfamily of Depressariinae of

Oecophoridae (Bradeley, 1972; Hodges, 1978). Recently, Heikkilä et al. (2013) redefined the family Depressariidae, separating it from Oecophoridae as a sister group of Lecithoceridae, Autostichidae, and Xyloryctidae.

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