

## Four Species of the Family Erebiidae (Lepidoptera), New to Korea

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### ABSTRACT

This paper reports four species of Erebiidae from the southern part of Korea: two Boletobiinae, *Honeyania ragusana* (Freyer, 1845), *Enispa masuii* Sugi, 1982, one Hermininae, *Adrapsa ablualis* Walker, 1859, and one Arctiinae, *Stictane rectilinea* (Snellen, 1879). *Honeyania ragusana* can be distinguished by the following: a blackish dot on the apex of the forewing with strongly curved medial lines, a long slender uncus and a strongly distally bifurcated valva with a large distally expanded costa and a thumb-shaped process of sacculus on the male genitalia as well as a sclerotized antrum, strongly tapered ductus bursae, and large corpus bursae on the female genitalia. *Enispa masuii*, a lichen feeder, can be distinguished by the whitish medial lines of the grayish fore- and hindwings, and a pair of rounded ball-shaped lamella antevaginalis, long, sclerotized ductus bursae, and pear-shaped corpus bursae without signum of the female genitalia. *Adrapsa ablualis* can be distinguished by the whitish medial lines of the fore- and hindwings and large medial process of the costa and dentate distal margin of the valva of the male genitalia. *Stictane rectilinea* can be distinguished by the broad dark grayish medial band of the forewing and the long knife-shaped valva with a strongly hooked process on the distal part of the sacculus of the male genitalia.

**Keywords:** Erebiidae, Boletobiinae, Hermininae, Arctiinae, new record, Korea

### INTRODUCTION

The family Erebiidae, which is one of the major quadrifid noctuoids, can be identified by the forewing pattern that is continued onto the patterned hindwing, a sharply angled post-medial line, and a darker triangle or trapezium with its base along the costa that is placed between the costa and the sub-marginal line or the apex (Zahiri et al., 2012). Totally, 24,500 species of the family have been described to date worldwide (Zahiri et al., 2012). In Korea, Kim et al. (2016) listed the Korean Noctuoidea species and included 491 species of Erebiidae. In this study, two species of Boletobiinae (*Honeyania ragusana*, *Enispa masuii*), one species of Hermininae (*Adrapsa ablualis*), and one species of Arctiinae (*Stictane rectilinea*) were newly recorded from the southern part of Korea. The aim of this study is to report four newly reported species of the family Erebiidae from Korea.

### MATERIALS AND METHODS

The moths were collected at night using a UV-light bucket trap with a 12 V battery (BioQuip, USA). For genitalia slide preparation, each specimen was prepared by boiling the abdomen in 10% KOH for approximately 15–20 min. The scales and tissues were removed, dehydrated with 99% ethanol, stained with Chlorazol black, and mounted on slides in Euparal mountant. The larvae were collected through the direct observation of plants and were reared at one of the authors' house (UHH) until eclosion. Genomic DNA of *Enispa masuii* was extracted from moth legs using the DNeasy Blood and Tissue Extraction Kit (Qiagen, UK) according to the manufacturer's instructions. The procedure from amplification to DNA sequence comparison followed Kim et al. (2019).

The terminology of the adult, including the male and female genitalia, refers to Scoble (1992). All materials were

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deposited in the Collection of Insects of the Department of Environmental Education, Mokpo National University. Abbreviations are as follows: TL, type locality; JJ, Jeju-do; and JN, Jeollanam-do.

## SYSTEMATIC ACCOUNTS

Order Lepidoptera Linnaeus, 1758  
Family Erebidae Leach [1815]  
Subfamily Boletobiinae Guenée [1858]  
Genus *Honeyania* Berio [1988]

<sup>1</sup>\**Honeyania ragusana* (Freyer, 1845)  
(Figs. 1A, 2A, B, G)

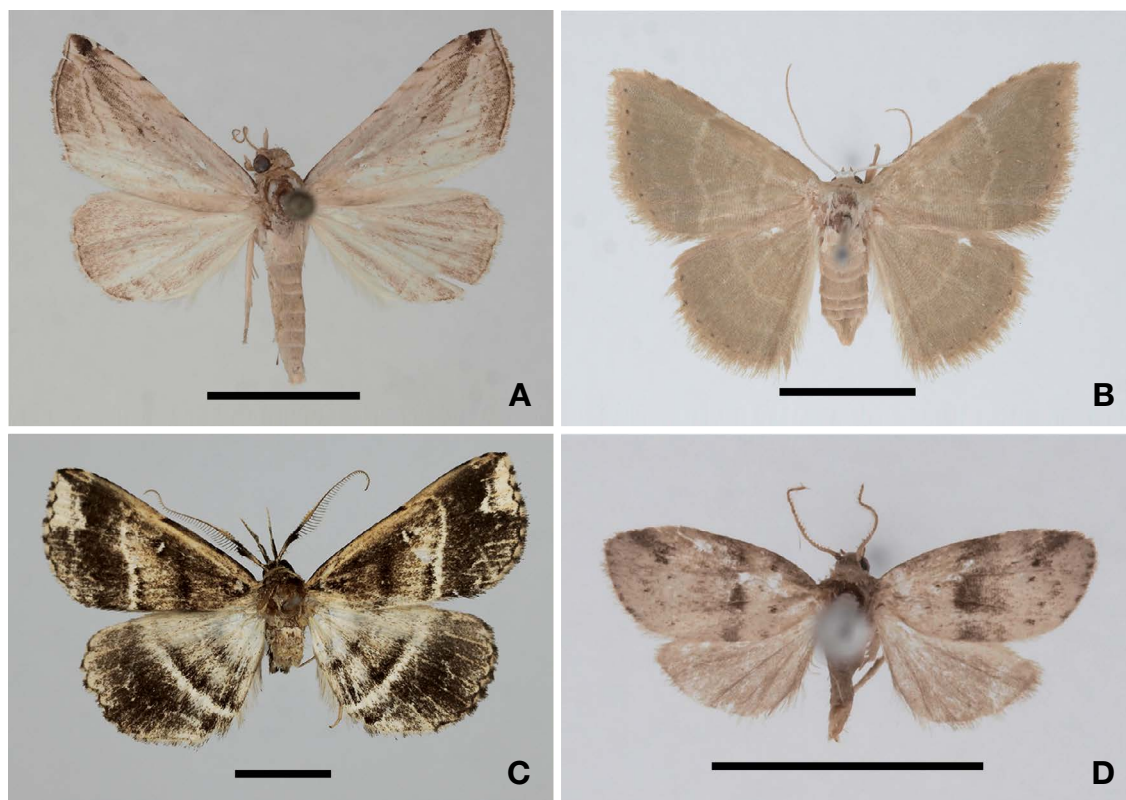
*Anthophila ragusana* Freyer, 1845: 92. TL: Italy, Sicily.  
*Anthophila virginea* Guenée, 1852: 248. TL: Java.  
*Anthophila cinerea* Ghilliani, 1854: 14. TL: Sardinia.  
*Thalpochares psilograma* Lederer, 1855: 207. TL: Cyprus.  
*Hypena quinquelinealis* Moore, 1877: 612. TL: Andaman Islands.

*Thalpochares dividens* Lucas, 1892: 87. TL: Brisbane.

**Material examined.** 1 male, Korea: JN: Goheung, Oenaro-do Island, 34°27'50"N, 127°28'06"E, 74 m above sea level, 7 Jul 2007, Choi SW.

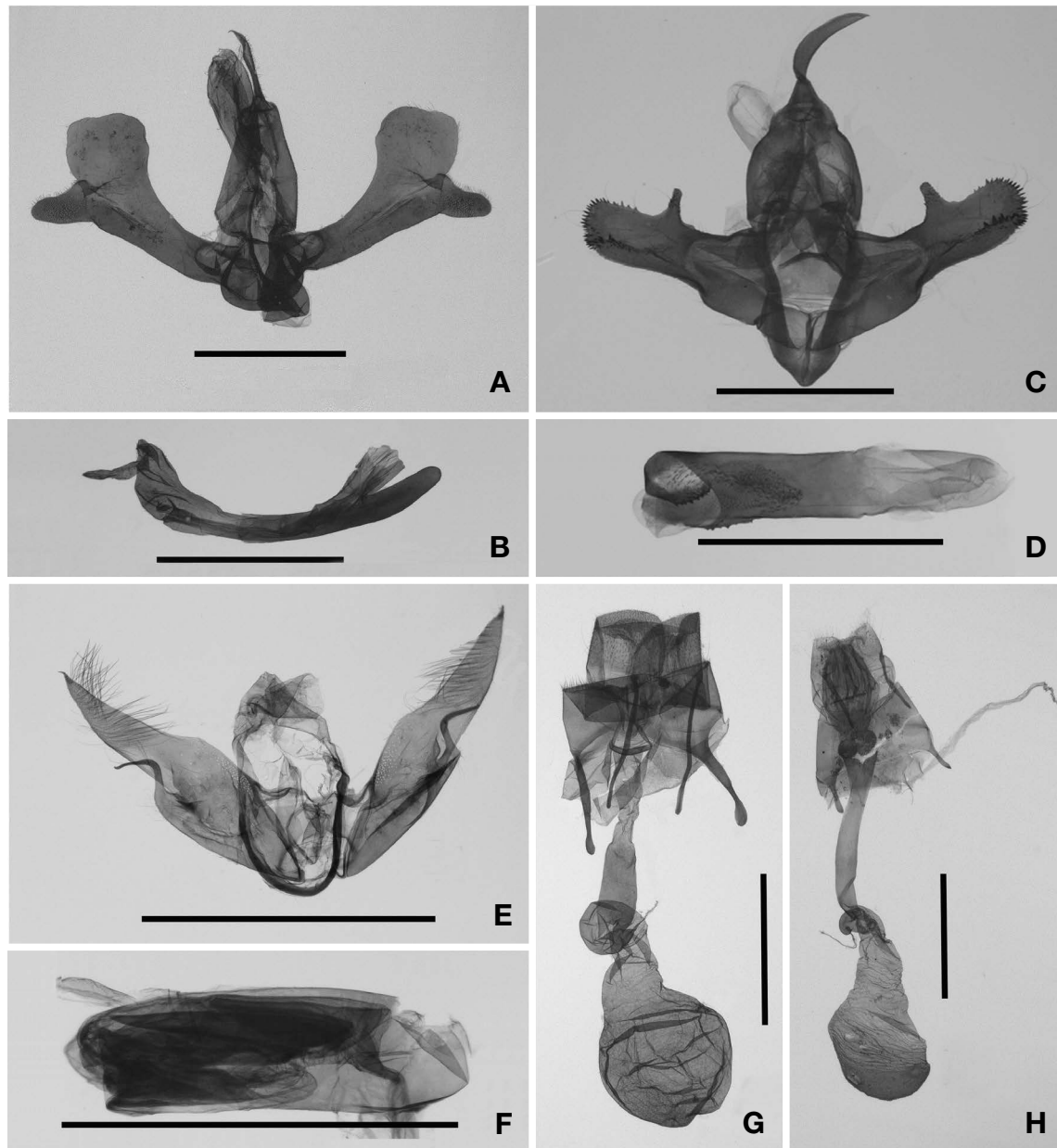
**Diagnosis.** Wingspan 15 mm. Antennae filiform; frons yellowish white, rounded; labial palpi upturned, long twice to eye diameter. Body yellowish white; legs yellowish white. Forewing ground color pale grayish; approximately three medial lines from the middle to the subtermen dark brownish, costally strongly curved; discal dot dark brown minute; apex tinged with black dots; termen tinged with blackish. Hindwing ground color pale grayish; postmedial line light blackish. Male genitalia: uncus long slender and sharply pointed, hooked apex; slender tegumen; strongly distally bifurcated valva with a large distally expanded costa, a thumb-shaped sacculus distal process, and a spinular harpe; and a long, rod-shaped aedeagus with a long tubular diverticulum lacking a cornutus.

**Distribution.** Korea (new record), Japan, Java, India, Australia, Europe (south).



**Fig. 1.** Adults of four Erebidae moth species from Korea. A, *Honeyania ragusana* (Freyer); B, *Enispa masuii* Sugi; C, *Adrapsa ablualis* Walker; D, *Stictane rectilinea* (Snellen). Scale bars: A–D = 10 mm.

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



**Fig. 2.** Male and female genitalia of the four Erebid species from Korea. A, B, G, *Honeyania ragusana* (Freyer); C, D, *Adrapsa ab-lualis* Walker; E, F, *Stictane rectilinea* (Snellen); H, *Enispa masuii* Sugi. Scale bars: A-H=1 mm.

**Remarks.** The genus *Honeyania* Berio is the monotypic taxon, occurring widely in subtropical and tropical regions from southern Europe to Australia. Adults of *H. ragusana* can be distinguished by the blackish dot on the apex of the forewing with strongly curved medial lines. The male genitalia of *H. ragusana* can be distinguished by the long slender uncus and strongly distally bifurcated valva with a large distally expanded costa and a thumb-shaped sacculus process. The female

genitalia of *H. ragusana* can be distinguished by the sclerotized antrum, strongly tapered ductus bursae and large corpus bursae. In Korea and Japan, the species is flying from July to September.

Genus *Enispa* Walker, 1866

<sup>1</sup>\**Enispa masuii* Sugi, 1982 (Figs. 1B, 2H)

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

*Enispa masuii* Sugi, 1982: 802. TL: Japan: Shikoku, Kagawa Pref., Okawa, Kusaka-toge.

**Material examined.** 1 female, Korea: JN: Suncheon, Seungju-eup, near Sunam-sa Temple, 11 May 2017, Heo UH.

**Diagnosis.** Wingspan 17 mm. Antennae filiform; vertex white; frons broad, light yellowish; labial palpi upturned, projected beyond frons, long, approximately twice the eye diameter. Body and legs whitish. Forewing ground color light greenish; antemedial line whitish, slanted; postmedial line whitish, dentate, medially zig-zag shaped; discal dot minute, black; subterminal line light whitish, undulating; termen with a series of black dots; underside tinged with black. Hindwing ground color light greenish; postmedial line whitish, transverse; subterminal line pale whitish, rounded; termen with black dots; underside basally with a black dot, whitish medial line and termen tinged with black. Female genitalia: lamella antevaginalis a pair of rounded ball-shaped; long tubular ductus bursae; and large pear-shaped corpus bursae that show a small sac posteriorly with ductus seminalis; signum absent.

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

**Remarks.** Three species of *Enispa* have been known in Korea: *E. lufefascialis* (Leech, 1889), *E. albosignata* (Staudinger, 1892), and *E. bimaculata* (Staudinger, 1892). *Enispa masuii* is externally similar to *E. lufefascialis*, but can be distinguished by the whitish medial lines of grayish fore- and hindwings. The female genitalia are similar to those of the other species of *Enispa* in the long, sclerotized ductus bursae and the pear-shaped corpus bursae without signum, but can be distinguished by the pair of rounded ball-shaped lamella antevaginalis. The larvae feed on lichen. The DNA sequence of *Enispa masuii* (GenBank accession No. MN984895) is similar to that of *E. niviceps* Turner (GenBank accession No. HQ949511.1), but the nucleotide sequence of *E. masuii* has a 6.05% sequence divergence from *E. niviceps*.

Subfamily Hermininae

Genus *Adrapsa* Walker [1859]

<sup>1</sup>\**Adrapsa ablualis* Walker, 1859 (Figs. 1C, 2C, D)

*Adrapsa ablualis* Walker, 1859: 170. TL: Ceylon.

*Bocana titysuasalis* Walker, 1859: 183. TL: Borneo, Sarawak.

*Herminia semicircularis* Lucas, 1892: 260. TL: Brisbane.

*Bocana subapicalis* Moore, 1885: 244. TL: Ceylon.

**Material examined.** 1 male, Korea: JJ: Jeju, Hankyungmyon, near Youngsu Reservoir, 33°19'02"N, 126°11'17"E, ca 25 m above sea level, 7 Aug 2016, Kim SS.

**Diagnosis.** Wingspan 27 mm. Antennae bipectinate in male,

basally with black tufts; frons yellowish white, bottom with projected hairs; labial palpi porrect, basally black, distally whitish, very long more than five times the eye diameter. Body blackish; legs grayish. Forewing ground color blackish; antemedial line thick, blackish; postmedial line light whitish, transverse; discal dot white, short line-shaped; subterminal line tinged with white, dentate; apex marked with large white dot. Hindwing ground color blackish; basally tinged with whitish; antemedial line thick, blackish; postmedial line thick, whitish, transverse; subterminal line pale whitish, undulating. Underside. Forewing whitish with a blackish antemedial line, discal dot, and broad subtermen; hindwing whitish with blackish antemedial and whitish postmedial lines with a black discal dot. Male genitalia: uncus slender; transtilla rounded; saccus triangular; valva slender with a medial process and distal spicules on the costa, and distal spicules on the sacculus; and rod-shaped aedeagus with a long patch of minute spicules on the diverticulum.

**Distribution.** Korea (new record), Japan, Taiwan, Philippines, China, Sri Lanka, Borneo, Queensland, New Caledonia.

**Remarks.** One species of *Adrapsa*, *A. simplex* (Butler, 1879), is known in Korea (Sohn et al., 2005). *Adrapsa ablualis* is externally similar to *A. simplex* but can be distinguished by the whitish medial lines of the fore- and hindwings. The male genitalia of *A. ablualis* can be distinguished from those of *A. simplex* by the large medial process of the costa and dentate distal margin of the valva.

Subfamily Arctiinae Leach, 1815

Tribe Lithosiini Billberg, 1820

Genus *Stictane* Hampson, 1900

<sup>2</sup>\**Stictane rectilinea* (Snellen, 1879) (Figs. 1D, 2E, F)

*Pitane rectilinea* Snellen, 1879: 91. TL: Celebes.

*Stictane rectilinea*: Hampson, 1900: 258.

**Material examined.** 1 male, Korea: JJ: Seogwipo, Daejeong-eup, Mooreung, 27 Jul 2017, Jeon JA.

**Diagnosis.** Wingspan 10 mm. Antennae bipectinate with short pectinations; frons broad, dark ochreous; labial palpi upturned, projected beyond frons, long about twice to eye diameter. Forewing ground color pale grayish; basally grayish; antemedial line indistinct, but with two black dots near the costa and dorsum; central fascia dark brown band-shape; subterminal line dark brown, costally strongly tinged with large dark brown dot, medially strongly projected with two black dots; termen lined with dark brown dots. Hindwing ground color dark brown. Male genitalia: uncus slender (not present

Korean name: <sup>1</sup>\*흰줄별박이수염나방 (신칭), <sup>2</sup>\*넓은띠회색불나방 (신칭)

in the examined specimen); valva long, knife-shaped with a strongly hooked process on the distal part of the sacculus; and stout aedeagus with a long spinular cornutus.

**Distribution.** Korea (new record), Japan, China, Singapore, Celebes, India.

**Remarks.** The genus *Stictane* comprised of approximately 24 species in the world, occurring mainly in Southeast Asia. The moths of the genus are small, gray forewings with a darker gray medial band and blackish spots at the end of the cell in submarginal and subbasal rows (Holloway, 2001). *Stictane rectilinea* is externally similar to a Bornean species, *S. muara* Holloway, 2001, but can be distinguished by the broad medial band of the forewing. In the male genitalia, *S. rectilinea* can be distinguished from *S. muara* by the short distal process and the lack of costal process on the valva.

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## CONFLICTS OF INTEREST

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

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