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Three Species of Spilomelinae (Lepidoptera, Crambidae) New to Korea

Jae-Cheon Sohn[1,*], Sung-Soo Kim[2], Sei-Woong Choi[3]

[1]Department of Science Education, Gongju National University of Education, Gongju 32553, Korea
[2]Research Institute for East Asian Environment and Biology, Seoul 05236, Korea
[3]Department of Environmental Education, Mokpo National University, Muan 58554, Korea

ABSTRACT

Three species of Spilomelinae, *Camptomastix septentrionalis* Inoue, 1982, *Omiodes indistinctus* (Warren, 1892) and *Piletocera aegimiusalis* (Walker, 1859), are reported for the first time from Korea. *Camptomastix septentrionalis* is distinguished from *Camptomastix hisbonalis* (Walker, 1859) in the smaller body size, the lack of a clear discal spot on the forewings, and having the less protruding costa of the valva in the male genitalia and the smaller antrum in the female genitalia. *Omiodes indistinctus* is distinguished from *Omiodes tristrialis* (Bremer, 1864) in having the narrower forewings with the faded postmedian and subbasal lines and a densely-setose, sclerotized area on the terminal part of uncus dorsally in the male genitalia. *Piletocera aegimiusalis* is distinguished from *Piletocera sodalis* (Leech, 1889) in the larger body size and the lack of a pale yellow patch on the hindwings. Photos of the external and genital features are provided for the three newly-recorded spilomeline species.

Keywords: Crambidae, Korea, Lepidoptera, Spilomelinae, taxonomy

INTRODUCTION

A crambid subfamily, Spilomelinae was once confused with Pyraustinae. These two subfamilies were distinguished by Minet (1982) who characterized Spilomelinae, based on a combination of seven characteristics. These characteristics were, however, not unique to the subfamily. In fact, there were no confirmed synapomorphies defining Spilomelinae. Lately, Mally et al. (2019) enhanced the systematic definition of Spilomelinae based on phylogenetic approaches and found one synapomorphy: the fornix tympani projecting ventrad from the tympanic frame. A tribal classification within Spilomelinae is still on progress (Mally et al., 2019). The subfamily currently includes 4,097 described species in 338 genera (Nuss et al., 2020).

The Korean Spilomelinae comprise 50 genera and 109 species (Kwon et al., 2019). Inventory of the Korean Spilomelinae may be incomplete, given continuous finding of new records (e.g., Choi and Kim, 2019; Choi et al., 2020; Sohn et al., 2020). The aim of the present article is to report three species of Spilomelinae new to Korea. The external and genital features of these moths are briefly described with photographs and compared with the resembling congeners known in Korea.

MATERIALS AND METHODS

All the specimens examined are deposited in three collections: GJUE, Gongju National University of Education; MPNU, Mokpo National University; and NIBR, National Institute of Biological Resources. Dissection of genitalia followed Clarke (1941) except that chlorazol black and Euparal resin were used for staining and permanent slide mounting, respectively. Terms of genitalia follow Klots (1970). The "GSN" in the collecting data indicates a genitalia slide number.

SYSTEMATIC ACCOUNTS

Order Lepidoptera
Family Crambidae
Subfamily Spilomelinae

*To whom correspondence should be addressed
Tel: 82-41-850-1666, Fax: 82-41-850-1660
E-mail: jsohn74@gjue.ac.kr

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Fig. 1. Adults of Crambidae. A, *Camptomastix septentrionalis* Inoue; B, *Omiodes indistinctus* (Warren); C, *Piletocera aegimiusalis* (Walker). Scale bars: A–C = 5 mm.

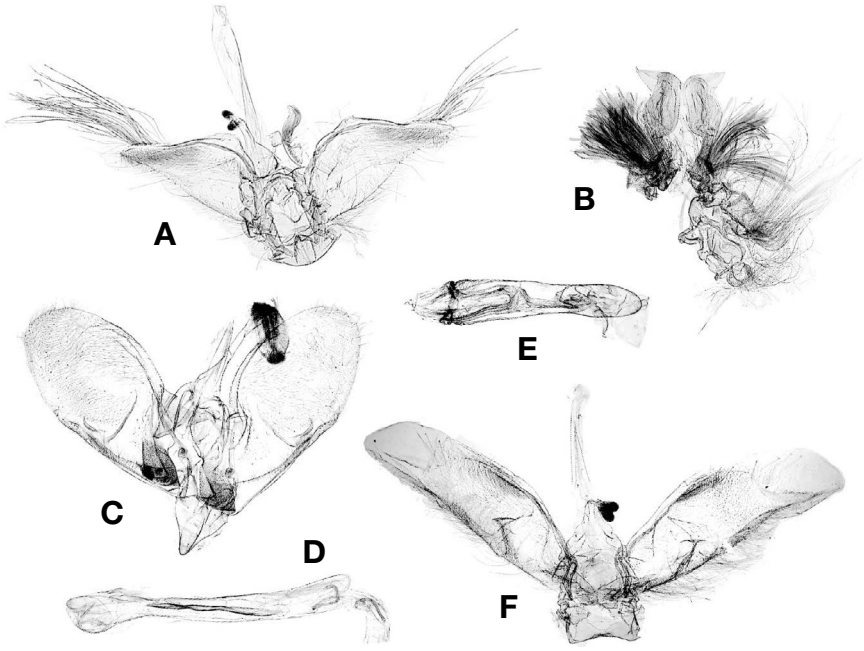

Fig. 2. Male genitalia of Crambidae. A, B, *Camptomastix septentrionalis* Inoue, genital capsule (A) and hair-pencils on sternite VIII and tergite VIII (B); C, D, *Omiodes indistinctus* (Warren), genital capsule (C) and phallus (D); E, F, *Piletocera aegimiusalis* (Walker), phallus (E) and genital capsule (F).

Genus *Camptomastix* Warren, 1892

Camptomastix Warren, 1892: 439. Type species: *Botys pacalis* Leech, 1889.

Camptomastyx Hampson, 1896: 238. Type species: *Botys hisbonalis* Walker, 1859.

This genus includes two species occurring in East Asia (Nuss et al., 2020). One congener, *Camptomastix hisbonalis* (Walker) has been known in Korea.

[1]***Camptomastix septentrionalis* Inoue, 1982 (Figs. 1A, 2A, 2B, 3A)**

Camptomastix septentrionalis Inoue, 1982: 329. Type locality: Japan, Akita Pref., Konoura-machi.

Material examined. 1♂, Korea: Gyongnam Prov.: Changnyeong-gun, Upo marsh, 28 May 2003, Sohn JC, [GSN] SJC-935, GJUE; 1♀, Ulleung-gun, Isl. Ulleungdo, Buk-myeon, Taeharyeong, 37°30′40.2″N, 130°49′35.8″E, 27 May 2017, Sohn JC, [GSN] SJC-1186, GJUE; 1♂, Jeonnam Prov.: Muan-gun, Cheonggye-myeon, Mokpo National University, 34°54′45.5″N, 126°26′13.2″E, 12 Jul 2017, Sohn JC, NIBR.

Description. Head (Fig. 1A): Vertex pale yellowish-brown, intermixed with pale brownish-gray scales; frons pale brown-

Korean name: [1]*나도흰가슴들명나방

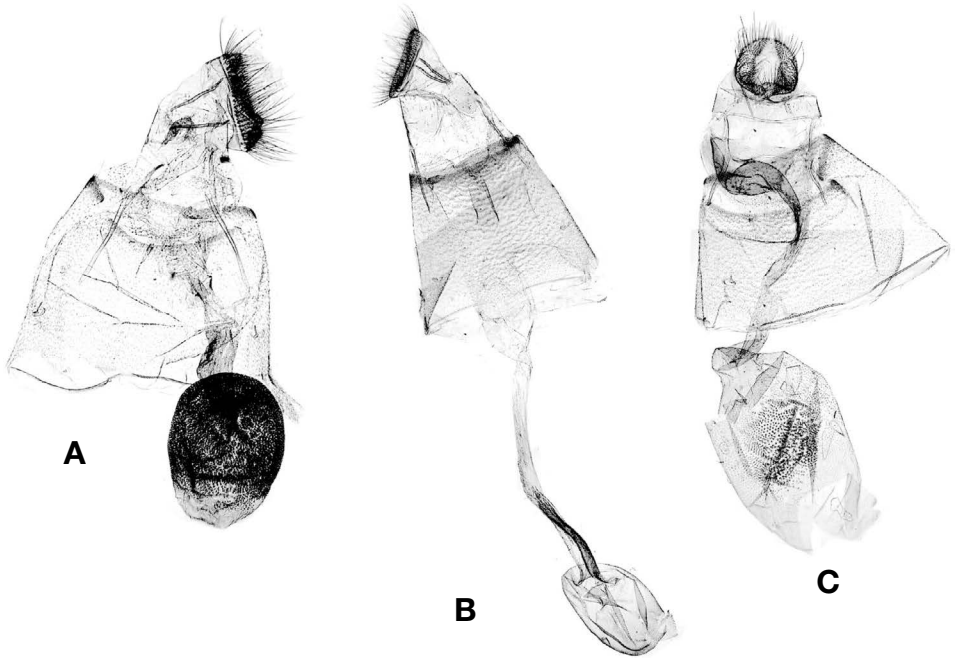

Fig. 3. Female genitalia of Crambidae. A, *Camptomastix septentrionalis* Inoue; B, *Omiodes indistinctus* (Warren); C, *Piletocera aegimiusalis* (Walker).

ish-gray on upper 1/3, dark brownish-gray on lower 2/3. Antenna 3/4 as long as forewing; scape pale brownish-gray laterally, pale orange mesally; flagellomeres pale grayish-orange. Labial palpus dark brownish-gray, with white scale tuft ventrally. Thorax (Fig. 1A): Patagium, tegula and mesonotum grayish-brown. Forewing length 7.0–7.5 mm, dark grayish-brown, darker along costal area; subbasal line vague, dark brown, angulate at middle; postmedian line vague, dark brown, serrate along veins, incurved in posterior 1/3; discal stigma, reniform, vague, dark brown; cilia brownish-gray. Hindwing and cilia brownish-gray. Male genitalia (Fig. 2A): Uncus elongate in distal half, bi-digitate and densely-setose apically. Tegumen subrectangular. Valva triangular, digitate apically, densely hairy on cucullus; costa protruding at basal 1/3, with long hair-pencil subapically; sacculus broad, triangular, sparsely setose. Saccus semi-circular, slightly protruding laterally. Female genitalia (Fig. 3A): Papillae anales oblique, narrow, densely-setose. Apophyses anteriores 2.2× longer than apophyses posteriores. Surrounding area of ostium bursae emarginated in funnel-shape. Ductus bursae broadened posteriorly, as long as corpus bursae; antrum bowl-shaped, 1/7 as long as ductus bursae. Corpus bursae globular, densely-scobinate on anterior 3/4.

Distribution. Korea (new record), Japan.

Host plants. Unknown.

Remarks. This species is similar to *Camptomastix hisbonalis* (Walker) in superficial appearance but differs from the latter in the smaller body size and the lack of a clear discal spot on the forewings. They can be better distinguished by the differences of their genitalia: the less protruding costa of the male valva and the smaller antrum in the female ductus bursae. *Camptomastix septentrionalis* has been known as an endemic species to Japan. Our records represent its first occurrence beside Japan.

Genus *Omiodes* Guenée, 1854

Omiodes Guenée, 1854: 355. Type species: *Omiodes humeralis* Guenée, 1854.

Synonyms in Bae et al. (2008)

This genus includes 98 species worldwide (Nuss et al., 2020) and seven species known from Korea (Kwon et al., 2019).

[1]**Omiodes indistinctus* (Warren, 1892) (Figs. 1B, 2C, 2D, 3B)

Acharana indistinctus Warren, 1892: 436. Type locality: Japan.

Omiodes indistinctus; Yamanaka, 2005: 287.

Material examined. 19♂, 5♀, Korea: Jeonnam Prov.: Gurye-

Korean name: [1]*희미세줄들명나방

gun, Toji-myeon, Mt. Jirisan, 35°18′01″N, 127°33′10″E, 1,370 m, 13 Aug 2009, Choi SW, An JS, Na SD, [GSN] SJC-1127 (♂), 1169 (♀), MPNU.

Description. Head (Fig. 1B): Vertex brownish-gray, tinged with white medially, intermixed with pale yellowish brown scales laterally; frons brownish-gray, tinged with pale yellowish-brown laterally. Antenna 2/3 as long as forewing; scape brownish-gray; flagellomeres pale brownish-gray. Labial palpus dark brownish-gray on outer surface, pale brownish-gray on inner surface. Thorax (Fig. 1B): Patagium grayish-brown; tegula grayish-brown, with pale brownish-gray hair-pencil beneath in males; mesonotum grayish-brown, intermixed with pale brownish-gray scales. Forewing length 11.0−12.5 mm, dark grayish-brown; postmedian line vague, dark brown, oblique, incurved on posterior 1/3; discal spot vague, small, dark brown; cilia dark brownish-gray. Hindwing dark grayish brown; postmedian line vague, dark brown, arched; cilia dark brownish-gray. Male genitalia (Fig. 2C): Uncus elongate on basal half, spatulate on terminal half, recurved apically, with dense-setal zone dorsally. Tegumen trapezoidal; tuba analis with elongate sclerite. Valva elliptical, setose, with curved bulge on basal 1/3; costa sclerotized on basal 2/3; sacculus 2/3 as long as valva, gradually enlarged to base, hairy along dorsal margin. Saccus subtriangular. Phallus (Fig. 2D) slightly curved, nearly of even width except terminal 1/5; cornutus needle-like, 1/2 as long as phallus. Female genitalia (Fig. 3B): Papillae anales oblique, narrow, setose. Apophyses posteriores 1/2 as long as apophyses anteriores. Surrounding area of ostium bursae shallowly emarginated. Ductus bursae 3.2× longer than corpus bursae, enlarged at terminal 1/3, scobinate on anterior 1/4 of one-side; antrum long-columnar, as long as apophyses posteriores. Corpus bursae globular; signum absent.

Distribution. Korea (new record), Japan.

Host plants. Unknown.

Remarks. This species is similar to *Omiodes tristrialis* (Bremer) in superficial appearance, but differs from the latter in having the narrower forewings with the faded postmedian and subbasal lines. They can be clearly distinguished from each other in the male genitalia: the presence of a densely-setose, sclerotized area on the terminal part of uncus dorsally in *Omiodes indistinctus* (Warren). This species has been known endemic to Japan. Tomisawa (2020) demonstrated that it occurs twice a year, late June to early July and late August to September, in Japan. The Korean specimens of *Omiodes indistinctus* in our collections were collected exclusively in August.

Genus *Piletocera* Lederer, 1863

Piletocera Lederer, 1863: 431. Type species: *Piletocera violalis* Lederer, 1863.

Synonyms in Bae et al. (2008)

This genus includes 92 species worldwide (Nuss et al., 2020) and five species in Korea (Kwon et al., 2019).

[1]**Piletocera aegimiusalis* (Walker, 1859) (Figs. 1C, 2E, 2F, 3C)

Desmia aegimiusalis Walker, 1859: 929. Type locality: Malaysia, Borneo, Sarawak.

Desmia cincta Walker, 1866: 1293. Type locality: New Guinea.

Desmia collaris Walker, 1866: 1293. Type locality: Morty.

Desmia mysolalis Walker, 1866: 1264. Type locality: Indonesia, West Papua, Misool.

Piletocera aegimiusalis; Inoue, 1982: 329.

Material examined. 1♂, Korea: Jeju Prov.: Namjeju-gun, Namwon-eup, Harye-ri, 33°18′56″N, 126°37′08″E, 264 m, 24 Aug 2004 (MNU), MPNU; 1♀, ditto, 27 Aug 2005, An JS, MPNU; 1♂, 1♀, ditto, 16 Jun 2007, Lee J, [GSN] SJC-1115; 1♀, ditto, 16 Aug 2009, An JS, [GSN] SJC-1179, MPNU; 1♀, Namjeju-gun, Namwon-eup, Sillye-ri, 33°19′57″N, 126°36′25″E, 486 m, 31 Aug 2007, Choi SW, MPNU; 1♂, Seogwipo-si, Sanghyo-dong, Donnaeko, 10 Aug 2005, Sohn JC, NIBR.

Description. Head (Fig. 1C): Vertex pale orange, intermixed with pale brownish-gray scales; frons brownish-white. Antenna 8/9 as long as forewing; scape dark brownish-gray; male flagellum pale brownish-gray, with dark brownish-gray hair-tuft at middle. Labial palpus dark brownish-gray. Thorax (Fig. 1C): Patagium large, brownish-gray, suffused with pale orange on basal 1/3; tegula and mesonotum pale brownish-gray. Forewing length 9.0−11.0 mm, dark brown, with purplish luster; postmedian bar present on distal 1/5 of costal area, pale yellow; discal stigma quadrate, pale yellow; pale yellow spot present near tornus; cilia dark brownish-gray. Hindwing dark brown, with purplish luster; postmedian line present only on tornal area, narrow, pale yellow; cilia dark brownish-gray, tinged with pale yellow on posterior half of termen. Male genitalia (Fig. 2F): Uncus elongate, subtriangular basally, bi-digitate and densely-setose apically. Tegumen subquadrate. Valva elongate, gradually broadened in basal 1/3, nearly of even width in distal 2/3, oblique along distal margin, narrowly round apically, densely-setose on basal 3/4; clasper present at basal 1/3 of valva, triangular; sacculus narrow, weakly sclerotized, setose. Saccus rectangular, slightly emarginated posteromedially. Phallus (Fig. 2E) nearly straight, gradually enlarged distally; cornutus needle-like, strongly bent at basal 1/4. Female genitalia (Fig. 3C): Papillae anales narrow, oblique, setose. Apophyses post-

Korean name: [1]*굽은수염들명나방

eriores as long as apophyses anteriores. Lamella antevaginalis U-shaped, sclerotized. Surrounding area of ostium bursae, emarginated, with band-like sclerite on one-side. Ductus bursae as long as corpus bursae, with columnar sclerotization at middle. Corpus bursae elliptical, with broad scobinate area at center.

Distribution. Korea (new record: Jeju Prov.), Japan, Taiwan, Southeast Asia, New Guinea.

Host plants. Unknown.

Remarks. This species is similar to *Piletocera sodalis* (Leech) in superficial appearance but differs from the latter in the larger body size and the lack of a pale yellow patch on the hindwings. Our collecting records of *Piletocera aegimiusalis* (Walker) show that it occurs exclusively in the Jejudo Island in South Korea.

ORCID

Jae-Cheon Sohn: https://orcid.org/0000-0002-1829-1307
Sung-Soo Kim: https://orcid.org/0000-0001-5693-4142
Sei-Woong Choi: https://orcid.org/0000-0001-6326-399X

CONFLICTS OF INTEREST

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

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