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Three unrecorded species of the genus *Glaucocharis* Meyrick (Lepidoptera: Crambinae) from Korea, with a checklist of the genus in Korea

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ABSTRACT

Three species, *Glaucocharis melistoma* (Meyrick), *Glaucocharis rosannoides* (Bleszynski), and *Glaucocharis vermeeri* (Bleszynski), of the genus *Glaucocharis* Meyrick of the subfamily Crambinae (Lepidoptera, Crambidae) are reported for the first time from Korea. Adults and genitalia images for the newly recorded species from Korea are provided, with a key to species of the genus *Glaucocharis* Meyrick. A checklist of the genus is given.

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Introduction

The genus *Glaucocharis* of the subfamily Crambinae (Lepidoptera, Crambidae) was established by Meyrick in 1938, based on a type species, *Glaucocharis stella* Meyrick, 1938, from New Zealand. The genus comprises 153 species worldwide. Of them, 49 species are known (Li and Li 2012), and four species have been known in Korea.

This genus can be recognized by following characters: (i) head with weak chaetosema and rounded frons; (ii) forewing pattern with distinct antemedian and postmedian line, apex usually with fascia; (iii) termen concaved from tip of R5 to M1, and sometimes with concaved at tip of M3, marginal spots developed; (iv) wing venation with Sc stalked with R1, R3 stalked with R4, R5 not stalked, M2 and M3 separated, cell opened; and (v) frenulum with three bristles in the female.

The aim of this study is to report the new three additional species for the fauna of Korea.

Material and methods

Materials and seasonal collecting dates in the present study are preserved in the Bio-Resource and Environment Center, Incheon National University (INU), Incheon, Korea. For the three newly known species, their adults and genitalia were illustrated. The genitalia were dissected by using Leica EZ4 stereomicroscope, and stained with Mercurochrome and Chlorazol black E, and mounted with Canada balsam. Photographs of adult and genitalia structure for all species were taken by a digital camera (Cannon EOS 50D) with a stereomicroscope (Leica S8APO, Singapore). Abbreviations for provinces are, CB: Chungcheongbuk-do, GB: Gyeongsangbuk-do, GG: Gyeonggi-do, GW: Gangwon-do, JJ: Jeju-do (Table 1).

Systematic accounts

Genus *Glaucocharis* Meyrick, 1938.

Type species (TS): *Glaucocharis stella* Meyrick, 1938.

Glaucocharis Meyrick, 1938: 426. TS: *Glaucocharis stella* Meyrick.
Ditomoptera Hampson, 1893: 179. TS: *Ditomoptera minutalis* Hampson.

Pareromene Osthelder, 1941: 366. TS: *Pareromene rebeli* Osthelder.
Pagmania Amsel, 1961: 332. TS: *Pagmania bilinealis* Amsel.

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Key to the species of genus *Glaucocharis* Meyrick in Korea based on the male genitalia characters (*excluded of *Glaucocharis copernici*)

1. Aedeagus without cornutus.....2
 - Aedeagus with cornutus.....*G. moriokensis*
2. Costal arm thorn-shaped and not straight.....3
 - Costal arm thorn-shaped and straight.....*G. vermeeri*
3. Valva bifurcated at apex, gnathos with minute setae.....4
 - Valva not bifurcated and hooked at apex, gnathos without minute setae.....*G. melistoma*
4. Sacculus not developed.....5
 - Sacculus well developed.....*G. electra*
5. Apical thorn a minute spine at subapical part.....*G. rosannoides*
 - Apical thorn dentate at subapical part.....*G. exsectella*

Key to the species of genus *Glaucocharis* Meyrick in Korea based on the female genitalia characters (*excluded of *G. copernici*, *G. electra*, and *G. melistoma*)

1. Corpus bursae with a signum.....2
 - Corpus bursae without signum.....*G. vermeeri*
2. Ostium without projection.....3
 - Ostium with M-shaped projection.....*G. moriokensis*
3. Antrum cylindrical.....*G. exsectella*
 - Antrum cup-shaped.....*G. rosannoides*

Table 1. Seasonal collecting data in Korea from May to October.

Species name	May			June			July			August			September			October			
	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	
<i>Glaucocharis electra</i> (Bleszyński)																			
<i>Glaucocharis exsectella</i> (Christoph)				–	–	–	–	*	–	–	–	–							
<i>Glaucocharis melistoma</i> (Meyrick)																			
<i>Glaucocharis moriokensis</i> (Okano)				–	+	*													
<i>Glaucocharis rosannoides</i> (Bleszyński)														+					
<i>Glaucocharis vermeeri</i> (Bleszyński)							–	–	–	–	–								

–, 1 ~ 5 specimens; +, 5 ~ 10 specimens; *, 10 < specimens.
E, early; M, middle; L, late.

Glaucocharis copernici (Bleszyński, 1965) [Jak-Eun-Jeom-Pul-Myeong-Na-Bang]

Pareromene copernici Bleszyński, 1965: 58–59. TL: W. Tien-Mu-Shan, Zhejiang, China.

Distribution. Korea, China.

Remarks. This species was first reported by Lee and Park (1999).

Glaucocharis electra (Bleszyński, 1965) [E-Ssang-Jeom-Jul-Pul-Myeong-Na-Bang]

Pareromene electra Bleszyński, 1965: 56. TL: W. Tien-Mu-Shan, Zhejiang, China.

Distribution. Korea, China.

Remarks. This species was first reported by Lee and Park (1999).

Glaucocharis exsectella (Christoph, 1881) [Mu-Ni-Kko-Ma-Pul-Myeong-Na-Bang]

Diptychophora exsectella Christoph, 1881: 41–43. TL: Amur.

Diptychophora japonica Inoue, 1955: 20–21. TL: Honshu, Japan.

Pareromene exsectella: Bleszyński, 1965: 55; Park, 1980: 181; Inoue, 1982, 1: 315, 2: 225, pl. 36: 57; Park, 1983: 304.

Distribution. Korea, China, Japan, Russia, Europe.

Remarks. This species was first reported by Park (1980).

**Glaucocharis melistoma* (Meyrick, 1931) [Yeon-Ssang-Jeom-Jul-Pul-Myeong-Na-Bang] (Figures 1A, 2A, 2A1)

Diptychophora melistoma Meyrick, 1931: 110. TL: Kwanshien, Szetschwan.

Pareromene melistoma; Bleszyński, 1965: 58.

Glaucocharis melistoma Wang, Gaskin & Sung 1988: 345–346. TL: China.

Adult. Wingspan 11–13 mm. Vertex white, erected; frons rounded, white; labial palpus 1st segment white, 2nd segment creamy white mixed with yellowish white, 3rd segment fuscous, 3rd segment 1/4 times as long as 2nd segment; maxillary palpus white and covered by white tuft at distal, 2 times longer than 3rd segment of labial palpus; proboscis covered with white scales at base; antenna serrate and ciliate inner side both of sex. Patagium and tegula white. Femur of forelegs white mixed with yellowish white; tibia white mixed with fuscous; tarsus creamy white. Mid-legs femur and tibia white; inner spur 1.5 times longer than outer one; tarsus creamy white. Hindlegs femur and tibia creamy white; mid inner spur slightly longer than outer one, very long; hind inner spur as long as outer one, 1/2 times as long as mid inner spur; tarsus creamy white. Forewing ground color white and scattered pale brown scales, interneural area yellow at costal part; median line

white inner side, brown outer side, arising from 1/4 of costa to 1/3 of dorsum, angled to outwards at anterior 1/4 of line; reniform stigma pale yellow, surrounded by brown scales; costal half area with yellowish brown fascia; medial part scattered pale brown scales; subterminal line brown, arising from 3/4 of costa to 4/5 of dorsum, angled to outwards at anterior 1/3 of line, then slightly dentate; external area yellow, apex with white fascia; two marginal dots black; termen concaved at anterior 1/4, 1/2 of margin; fringe white mixed with grayish brown. Hindwing creamy white; fringe white, fuscous at posterior margin.

Male genitalia. Uncus long and slender, slightly curved, pointed at apex. Gnathos as long as uncus, billowed at half of distal, rounded at apex; tegmen 3/4 times as long as uncus, slender, and sclerotized, without lateral lobes. Valva long and narrow, 2 times longer than uncus, curved to upwards at apex; costa straight, 3/4 of costa curved to upwards; costal arm long and waved, basal half billowed, distal half narrowed, rounded at apex, 1/3 times as long as valva; sacculus indistinct; juxta small; vinculum narrow; saccus broaden with rounded at apex. Aedeagus rod-shaped, as long as valva, rounded at base; apical thorn membranous with hook-shaped; cornutus absent.

Distribution. Korea, China, Japan.

Specimens examined. [CB] 2♂, Mt. Sobaek, Danyang-gun, (N36°54'27.73", E128°25'18.98"), 5 viii 2015 (Heppner J.B., Park B.S., Na S.M., Lee D.J.), INU, gen. sl. no. INU-3978(♂), 3983(♂).

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