

# Review of the Genus *Eumetriochroa* (Lepidoptera: Gracillariidae: Oecophyllembiinae) from Korea

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## ABSTRACT

The genus *Eumetriochroa* Kumata & Kuroko, 1988 has been known as a small genus with twelve described species worldwide. In this study, we aimed to review the Korean species of the genus *Eumetriochroa* of the subfamily Oecophyllembiinae, which belongs to the family Gracillariidae. Three species of this genus are recognized from Korea. Among them, two species, *Eumetriochroa araliella* Kobayashi, Huang & Hirowatari, 2013 and *E. hiranoi* Kumata, 1998 are reported for the first time from Korea. All the known species were enumerated with their available information and briefly redescribed for the newly recorded species. The adults and genitalia of all the species are redescribed and illustrated.

**Keywords:** Oecophyllembiinae, newly recorded species, leafminer, taxonomy, Korea

## INTRODUCTION

In Korea, 99 species, belonging to 25 genera in the family Gracillariidae have been known up to date (Byun et al., 2009; Shin et al., 2015; Kim and Byun, 2016, 2017, 2019, 2022a, 2022b, 2022c; Lee et al., 2017; Park and Lee, 2021; Kim et al., 2022a, 2022b, 2022c, 2022d, 2022e; Lee and Jeun, 2022). Among them subfamily Oecophyllembiinae, which is a cosmopolitan group, was proposed by Kumata (1998), based on the presence of larval spiracles on the mesothorax and hindwing venation. Most of them are distributed in the Oriental 74 species, Afrotropical 55 species, Australasian 55 species, Nearctic 49 species, Neotropical 30 species and Palearctic 34 species for the biogeographic regions respectively (De Prins and De Prins, 2006–2022).

In Korea, the subfamily has not been known in Korea until Lee and Jeun (2022) reported one species *Eumetriochroa hederarum* Kumata, 1998 of the subfamily.

Here, we aimed to review the Korean species of the genus *Eumetriochroa* of the subfamily Oecophyllembiinae, belonging to the family Gracillariidae. In this review, three species were recognized from Korea. Among them, two species, *Eumetriochroa araliella* Kobayashi, Huang & Hirowatari, 2013

and *Eumetriochroa hiranoi* Kumata, 1998, were reported for the first time in Korea.

## MATERIALS AND METHODS

The specimens examined in this study were deposited at the Systematic Entomology Laboratory of Hannam University, Daejeon, Korea (HNUSEL). Male and female genitalia were dissected and mounted with Euparal solution, following the procedure described by Holloway et al. (1987). Images of the adults were taken using a digital camera (Canon EOS 600D; Canon Inc., Tokyo, Japan) and images of the genitalia were captured using a digital camera attached to a microscope, LEICA M205C (Leica Microsystems, Wetzlar, Germany) and refined using Photoshop CS5 software.

The abbreviations used in this study for locality in Korea are as follows: CN (Chungcheongnam-do), JN (Jeollanam-do), TL (type locality), and TD (type depository). Additionally, the specimen depositories in this study were examined from the following collections: EIHU, Entomological Institute, Hokkaido University, Japan; HNUSEL, Hannam University, Korea; OPU, Osaka Prefecture University, Sakai, Japan.

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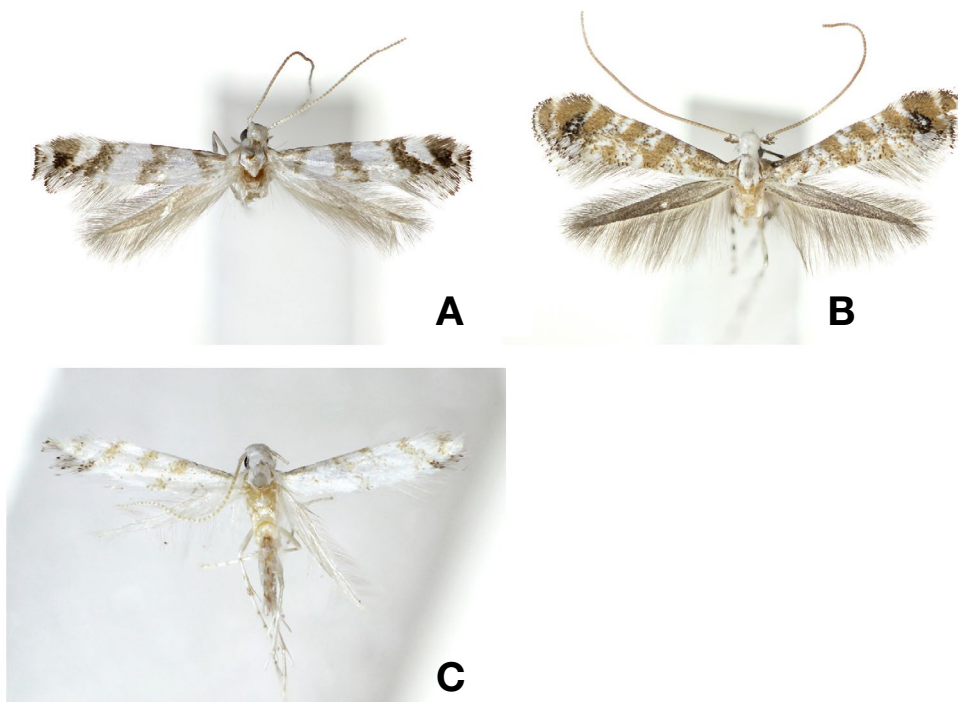


Fig. 1. Adults. A, *Eumetriochroa araliella*; B, *E. hederiae*; C, *E. hiranoi*.

**SYSTEMATIC ACCOUNTS**

Order Lepidoptera Linnaeus, 1758  
 Family Gracillariidae Stainton, 1854  
 Subfamily Oecophyllembiinae Réal & Balachowsky, 1966  
 Genus *Eumetriochroa* Kumata, 1998  
*Eumetriochroa* Kumata, 1998: 83–84.  
 Type species: *Eumetriochroa hederiae* Kumata, 1998

**Diagnosis.** The genus *Eumetriochroa* Kumata, 1998 is distinguished from other genera by the straight stria on the apex margin showing the forewing as rectangular shaped and the absence of the maxillary palpus.

**Distribution.** Australasian, Oriental, Palearctic regions.

**Key to the species of the genus *Eumetriochroa* in Korea**

1. Forewing ground color ochreous with irregular white fasciae ..... *Eumetriochroa hederiae*  
 – Forewing ground color white with regular fuscous or ochreous fasciae ..... 2
2. Corpus bursae of female genitalia large, ovate with a large and anchor-shaped signa ..... *E. hiranoi*

– Corpus bursae of female genitalia small, sack-shaped, with a small corniform signa ..... *E. araliella*

**<sup>1</sup>*Eumetriochroa araliella* Kobayashi, Huang & Hirowatari, 2013 (Figs. 1A, 2B, Ba)**

*Eumetriochroa araliella* Kobayashi, Huang & Hirowatari, 2013: 113–115. TL: Nara, Japan. TD: OPU (Holotype; Paratypes).

**Material examined.** Korea: 1 female, JN: Sinan-gun, Heuksan-myeon, Gafeodo-ri, 16 May 2008, leg. NH Ahn, gen. slide no. HNUSEL-5478-coll. HNUSEL.

**Redescription.** Adult (Fig. 1A): Wingspan 5.0 mm. Head and frons white; labial palpus porrect and white with pale fuscous basal; antennae white and each segment with pale brown rings. Thorax white and tinged with a pale fuscous.

Forewing ground color white with fuscous fasciae; costa basal fuscous and stretched to outward obliquely; first fascia oblique inwards, as wide as the intervals between the second fascia; the second fascia more oblique than the first one with a very narrow stria; apical fuscous; cilia white to tornus and more darkened apically with fuscous stria.

**Male genitalia.** Unknown in Korea.

**Female genitalia** (Fig. 2B, Ba). Papillae anales membranous

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

with sclerotized apical setae; apophyses posteriores and anteriores somewhat stout with a wide base. Antrum slightly sclerotized. Ductus bursae reduced with an obscure boundaries with corpus bursae. Corpus bursae ovate and membranous with a signum; a corniform signa on the center of corpus bursae and minute spinules surround the signum.

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

**Host plants.** *Dendropanax trifidus* (Thunb.) Makino ex H. Hara, *Eleutherococcus sciadophylloides* (Franch. & Say.) H. Ohashi, *Evodiopanax innovans* (Siebold & Zucc.) Nakai, and *Fatsia japonica* (Thunb.) Decne. & Planch. [Araliaceae] in Japan (Kobayashi et al., 2013; De Prins and De Prins, 2006–2022).

<sup>1</sup>\**Eumetriochroa hederæ* Kumata, 1998 (Figs. 1B, 2A, 2C, Ca)

*Eumetriochroa hederæ* Kumata, 1998: 85–89. TL: Kyūshū, Japan. TD: EIHU (Holotype; Paratypes).

**Material examined.** Korea: 1 male, 1 female, JN: Goheung-gun, Oenaro-do, 18 May 2018, leg. NH Ahn, gen. slide no. HNUSEL-5707, 5708- coll. HNUSEL.

**Redescription.** Adult (Fig. 1B): Wingspan 8.5–9.5 mm. Head and face white; labial palpus white with slightly thickened second segment on apex; antenna pale gray and scape with a blackish apical ring. Thorax white and tegular ochreous posteriorly; legs white with fuscous apical rings on tarsus.

Forewing ground color ochreous with irregular white fasciae; from base to 1/3 of forewing with 3 of irregular white fasciae; two obliquely fasciae at middle; again two obliquely fasciae at 2/3 to base; two apical costa striae at 4/5 and apical margin respectively; many tiny blackish spots scattered from base to apical part with a large black spot near apex medially; cilia grayish fuscous to tornus and more darkened with blackish striae on apex margin. Hindwing ground color dark fuscous with long ciliae and somewhat bright as ochreous apically.

**Male genitalia** (Fig. 2A). Tegumen 1.3 times longer than valva, broadened at base and narrowed apical with bifurcated apex; long setae along the apical margins and lateral margin. Valva narrow and slender and straight apically; long setae along costal margin and inner surface and a highly sclerotized and stout spinules at apex. Vinculum rectangular with wide base; saccus extremely narrowed to bar-shaped and as long as vinculum. Aedeagus 1.5 times longer than the valva and narrowed apically; a long sclerotite with spinules on apex.

**Female genitalia** (Fig. 2C, Ca). Papillae anales moderate;

apophyses posteriores and anteriores with a broadened base. Ostium bursae wide; antrum as long as a half of apophyses anteriores with a sclerotized plate. Ductus bursae membranous and slightly swollen below antrum. Corpus bursae ovate and slightly elongated with a signum; signum coniform with wide base, located on the middle of corpus bursae.

**Distribution.** Korea, China, Japan.

**Host plants.** *Hedera nepalensis* var. *sinensis* (Tobl.) Rehd. and *H. rhombea* (Miq.) Bean [Araliaceae] in China (Kobayashi et al., 2011; De Prins and De Prins, 2006–2022). *H. rhombea* (Miq.) Bean [Araliaceae] in Japan (Kumata, 1998; De Prins and De Prins, 2006–2022).

**Remarks.** This species was first reported in Korea by Lee and Jeun (2022).

<sup>2</sup>\**Eumetriochroa hiranoi* Kumata, 1998 (Figs. 1C, 2D)

*Eumetriochroa hiranoi* Kumata, 1998: 96–99. TL: Ryūkyū Island., Japan. TD: EIHU (Holotype; Paratypes).

**Material examined.** Korea: 1 female, CN: Seosan-si, Gwanamun-gil, 25 Jun 2018 (leg. BK Byun), gen. slide no. HNUSEL-5706-coll. HNUSEL.

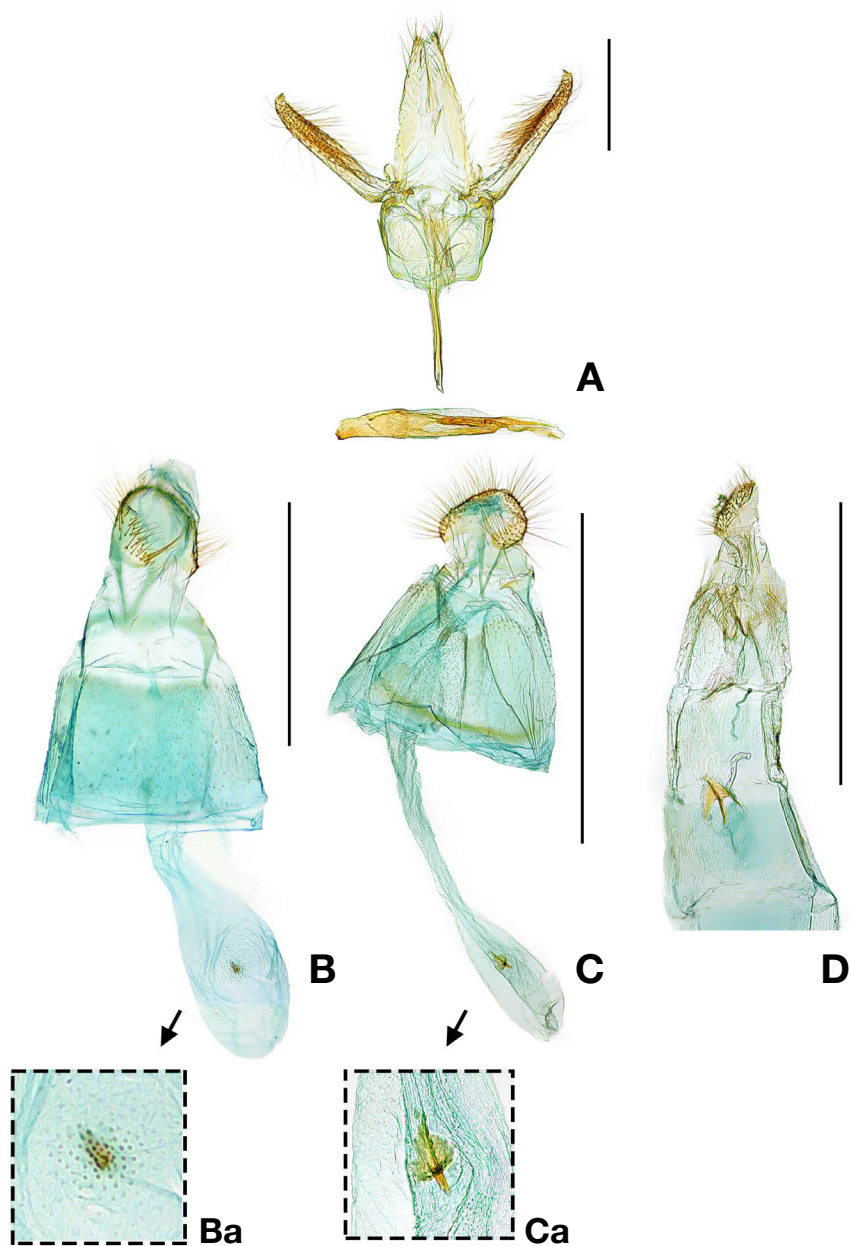
**Redescription.** Adult (Fig. 1C): Wingspan 4.5 mm. Head and labial palpus snow white with second segment of palpus apically and the terminal segment medially ringed with fuscous; antenna as long as or slightly shorter than forewing, annulated with fuscous; scape and its hairy pecten snow-white. Thorax snow-white; legs white, fore-femur fuscous on apex half and tarsus with blackish apical rings. Forewing snow-white with an ochre-brownish costal spot near base and five same colored oblique fasciae arranged from subbase to subapex; first fascia at subbase typically not reaching dorsal margin, and sometimes reduced into a costal spot; third fascia also detached from dorsal margin or interrupted by ground color at wing fold; fourth fascia enclosing a spot of blackish irroration in its apex just beyond tornus; an ochre brownish line running in interspace between first and second fasciae and an additional one between third and fourth fasciae; apical extremity of wing faintly tinged with ochreous scales; cilia whitish gray, with a vertical fringe line of black irroration at apex of wing and two similar one, but curved, lines along the termen. Hindwing whitish gray, becoming paler towards the base, with cilia grayish white.

**Male genitalia.** Unknown in Korea.

**Female genitalia** (Fig. 2D). Papillae anales elongated on dorsally with long and dense setae on apex. Ductus bursae moderate, long and membranous. Corpus bursae ovate with a large anchor-shaped signum.

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

Korean name: <sup>1</sup>\*송악가는나방, <sup>2</sup>\*애기줄무늬가는나방 (신칭)



**Fig. 2.** Male and female genitalia. A, Male genitalia: *Eumetriochroa hederæ* (gen. slide no. HNUSEL-5707); B–D: Female genitalia: B, *E. araliella* (gen. slide no. HNUSEL-5478); Ba, ditto, signum; C, *E. hederæ* (gen. slide no. HNUSEL-5708); Ca, ditto, signum; D, *E. hiranoi* (gen. slide no. HNUSEL-5706). Scale bars: A–D=0.5 mm.

**Host plants.** *Styrax japonicus* Siebold & Zucc. [Styracaceae] in China (Bai et al., 2016; De Prins and De Prins, 2006–2022). *S. japonicus* Siebold & Zucc. [Styracaceae] in Japan (Kumata, 1998; De Prins and De Prins, 2006–2022).

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## CONFLICTS OF INTEREST

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

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