

# New Record of the Genus *Calicotis* Meyrick, 1889 (Lepidoptera: Stathmopodidae) from the Korean Peninsula

In-Won Jeong<sup>1,2</sup> and Sora Kim<sup>1,2\*</sup>

<sup>1</sup>Department of Agricultural Convergence Technology, Jeonbuk National University, Jeonju 54896, Korea

<sup>2</sup>Lab. of Insect Phylogenetics and Evolution, Department of Plant Protection & Quarantine, Jeonbuk National University, Jeonju 54896, Korea

## *Calicotis* Meyrick, 1889 속(나비목: 감꼭지나방과) 미기록 종 한반도 첫 보고

정인원<sup>1,2</sup> · 김소라<sup>1,2\*</sup>

<sup>1</sup>전북대학교 농축산식품융합학과, <sup>2</sup>전북대학교 식물방역학과 곤충계통진화연구실

**ABSTRACT:** In this study, we report *Calicotis chrysoptera* Terada 2016, an unrecorded species belonging to the genus *Calicotis* Meyrick, 1889, for the first time from the Korean Peninsula. A diagnosis, photographs, and descriptions of the adult and genitalia are provided, along with SEM (Scanning Electron Microscope) images to illustrate morphological diversity further.

**Key words:** Stathmopodidae, New record, *Calicotis chrysoptera*, SEM

**초록:** 이번 연구에서, *Calicotis* Meyrick, 1889 속에 속하는 미기록종 *Calicotis chrysoptera* Terada 2016를 한반도에 최초로 보고한다. 해당 종에 대한 진단, 성충과 생식기에 대한 사진 및 기재문을 함께 제공하며, SEM (주사 전자 현미경) 사진을 통해 형태적 다양성을 확장시킨다.

**검색어:** 감꼭지나방과, 미기록종, 금줄흔찌꼭지나방(신칭), SEM

The family Stathmopodidae, first reported in 1913, has since been documented worldwide with more than 40 genera and 400 species (van Nieukerken et al., 2011). Species belonging to this family exhibit diverse ecological characteristics, with larvae feeding on various crops, pine trees, mosses, and fern spores, or displaying carnivorous behavior by consuming spider eggs and aphids (Downes, 1994; Terada, 2016). In particular, given that fern spore consumption is known from only four families among micro-moths, further research on these taxa is important for elucidating their evolutionary

relationships (Zimmerman, 1978; Lees and Zilli, 2019; Fuentes-Jacques et al., 2022). In Korean Peninsula, the first report of fern spore-consuming species within the family Stathmopodidae was *Cuprina fuscella* Sinev, followed by *Calicotis latebrifica* Terada (Koo et al., 2018; Sohn, 2023). In this study, we additionally report *C. chrysoptera* Terada, 2016, providing photographs, descriptions, and Field Emission Scanning Electron Microscope (FE-SEM) imaging to further document and expand knowledge of its distribution and morphological diversity.

\*Corresponding author: [skim01@jbnu.ac.kr](mailto:skim01@jbnu.ac.kr)

Received April 7 2025; Revised August 8 2025

Accepted August 14 2025

## Materials and Methods

### Collection

Specimens were collected using light traps (mercury vapor lamp, 220 V/400 W) and bucket traps (black light, 12 V/20 W). The specimens were pinned through the thorax with wings spread and then dried in an oven at 50°C for at least three weeks.

### Identification

For identification, dissections followed the protocol described by Kim et al. (2017). All dissections were performed under an EZ4 stereomicroscope (Leica, Germany). Photographs of the adults and their genitalia were taken using a Leica S8APO stereomicroscope (Leica, Germany) equipped with a Tucsen Dhyana 400 DC digital camera (Tucsen, China) and a Leica LED 5000 HDI dome illuminator (Leica, Germany). Multifocal images were merged into single photographs using Mosaic software (Tucsen, China) and Helicon Focus software (Helicon Soft, Ukraine), and the final images were edited with Adobe Photoshop 2024 (Adobe, USA).

### SEM imaging

A conductive carbon double-sided tape 5mm (Nissin EM Co., Japan) was attached to the SEM plate. The plate with the attached sample was coated with platinum for 90 seconds using a Leica EM ACE200 (Leica, Germany) under vacuum conditions created by an Adixen 2005 SD vacuum pump (PFEIFFER VACUUM, Germany). Imaging was performed using a Gemini 500 FE-SEM (Carl Zeiss, Germany) in the Center for University-wide Research Facilities (CURE) at Jeonbuk National University, with sample adjustment and movement controlled via ZEN core Documentation (Carl Zeiss, Germany).

## Results

### Taxonomic accounts

#### Family Stathmopodidae Meyrick, 1913

Stathmopodidae Meyrick, 1913: 310. Type genus. *Stathmopoda* Herrich-Schäffer

#### Genus *Calicotis* Meyrick, 1889

*Calicotis* Meyrick, 1889: 170. Type species. *Calicotis crucifera* Meyrick, 1889

*Calicotis chrysoptera* Terada, 2016 (신칭: 금줄홀씨꼭지나방) (Figs. 1–2)

*Stathmopoda* sp. 3: Oku, 2003. Type locality. Japan

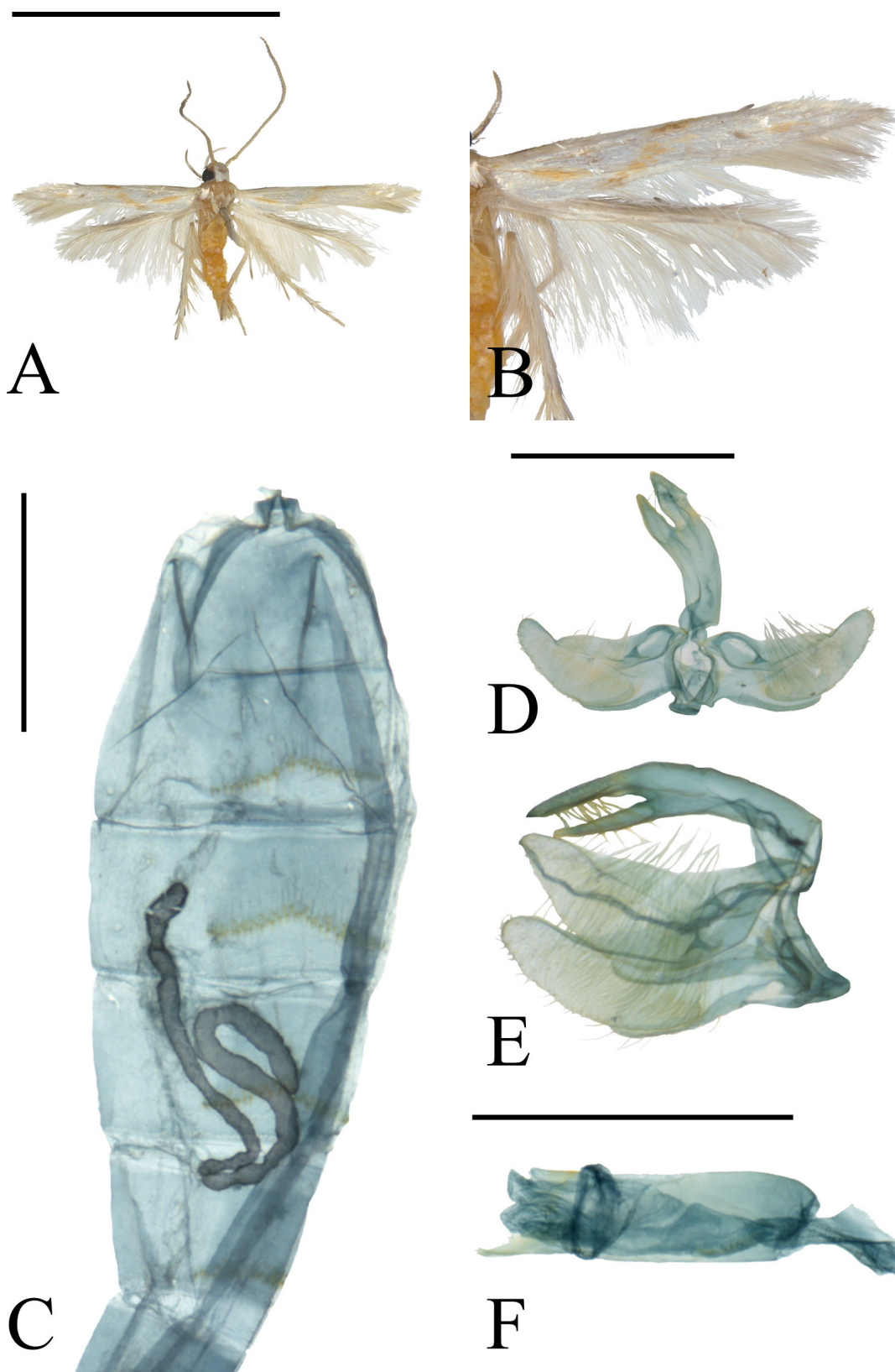
*Stathmopoda* sp. 3: Terada and Sakamaki, 2013

*Calicotis chrysoptera* Terada, 2016: 124

**Materials examined.** 3 individuals: 1 male, Baekgok-ri, Mado-myeon, Hwaseong-si, GG, Korea, 21.vii.2019, M. Yeom, gen. slide. No. IPE JBNU-13273/ I.W. Jeong; 1 individual, Baekgok-ri, Mado-myeon, Hwaseong-si, GG, Korea, 21.viii.2019, M. Yeom; 1 male, Geumgap-ri 980, Uisin-myeon, Jindo-gun, JN, Korea (34°22'3", 126°17'47"), 30.vii.2023, Kim et al., gen. slide. No. IPE JBNU-13264/ I.W. Jeong.

**Diagnosis.** This species is similar to *C. latebrifica* Terada and *C. rotundinidus* Terada, but the marking of the forewing differs. In *C. latebrifica*, from base to 2/5 of costal and markings are grayish brown. In *C. rotundinidus*, have a pale grayish-brown spot near the base. But in this species, there is no spot near the base and the markings are pale ocher. In male genitalia, this species is similar to *C. exclamationis* Terada, but has differences from gnathos and sacculus. In *C. exclamationis*, it has relatively broad gnathos and a short sacculus that is concave in the middle. But in this species, it has narrow gnathos and a 1.5 times longer sacculus that is convex at 2/3.

**Description.** *Adult.* wing span 7.6–8.0 mm. Head white. Antenna pale ocher with grayish apex. Labial palpus yellowish white. Thorax yellowish white. Abdomen ocher with pale yellow scales at each segment caudally. Forewing yellowish white; costal pale grayish white; pale ocherous streak on CuP from 2/11 to 6/11; pale ocherous fascia oblique bar-shaped at the median; pale ocherous blotch at 5/7; fringes pale gray. Hindwing pale gray; costal gray; in male, one frenulum originating from three pairs of strands; scale with evenly



**Fig. 1.** *Calicotis chrysoptera*. A, adult, scale bar: 5.0 mm; B, wing; C, abdomen, scale bar: 0.5 mm; D, male genitalia of caudal view, scale bar: 0.5 mm; E, male genitalia of lateral view; F, aedeagus, scale bar: 0.5 mm.

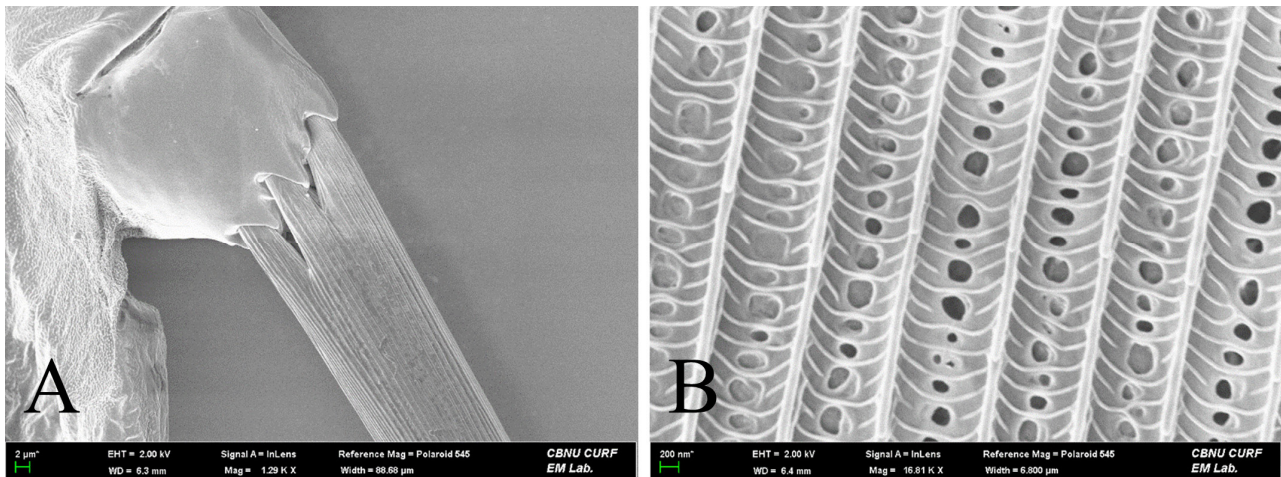


Fig. 2. SEM image of *Calicotis chrysoptera*. A, frenalum; B, scale of the hindwing.

spaced grooves, each groove with relatively uniform-sized holes aligned in a straight line, disconnected partitions on both sides of each hole, partitions separating adjacent holes; fringes gray. *Male genitalia*. Uncus tapering with a blunt apex, numerous setae on lateral margin. Gnathos as long as uncus, tongue-shaped with blunt apex. Valva with round apex; costa round dorsally; cucullus twice longer than uncus, narrow oval-shaped, numerous long setae at the inner surface; sacculus sclerotized with a blunt apex, concave near base and convex at 2/3, some setae ventrally. Vinculum with blunt apex; saccus 1.3 times longer than uncus. Juxta subpentagon. Anellar lobes weakly sclerotized with some setae. Aedeagus three times longer than uncus; weakly sclerotized wrinkles at vesica; cornutus absent.

**Host.** *Thelypteris acuminata* (Houtt.) C. V. Morton (Thelypteridaceae) and *Pteridium aquilinum* (L.) Kuhn (Dennstaedtiaceae) (Terada, 2016).

**Distribution.** Korea, Japan.

## Acknowledgments

This work was supported by a grant from the Honam National Institute of Biological Resources (HNIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (HNIBR202401220). Additionally, this work was supported by the National Research Foundation of Korea (NRF)

grant funded by the Korean government (MSIT) (No. RS-2024-00345586).

## Statements for Authorship Position & Contribution

Jeong, I.-W.: Jeonbuk National University, Student in MS; Collecting materials, Conducted the experiments, wrote the manuscript, morphological identifications, preparing genitalia vouchers and figures, revising, taking pictures

Kim, S.: Jeonbuk National University, Professor; Designed the research, wrote the manuscript, editing, revising, finance support

All authors read and approved the manuscript.

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