

# Report of fern spore-feeding *Calicotis latebrifica* Terada, 2016 (Lepidoptera, Stathmopodidae) new to Korea

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A fern spore-feeding stathmopodid species, *Calicotis latebrifica* Terada, 2016 is reported for the first time from Korea on the basis of one male and three females from Island Chujado, Jeju Province. This record represents the third example of the Korean Lepidoptera associated with fern spores for larval food items. The species is similar to *Cuprina fuscella* Sinev, 1988 in feeding on fern spores but differs from the latter in the body color and the presence of cilia on the ventral side of antennal flagellum. The genus *Calicotis* is introduced for the first time to the Korean fauna. *Calicotis latebrifica* has been known exclusively from Japan before this study. Larval habits for feeding and shelter construction were demonstrated from field observation and rearing in captivity. A new host plant of *C. latebrifica*, *Dryopteris nipponensis* Koidz. is recorded. The habitus and genitalia of both sexes are briefly described for *C. latebrifica* with photographs.

Keywords: *Calicotis*, fern spores, Korea, Lepidoptera, Stathmopodidae

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## INTRODUCTION

Spore feeding accounts for a small portion (as much as 6.5%) among fern-insect interactions (Fuentes-Jacques *et al.*, 2022). However, spore feeders severely affect the reproduction of ferns, for example, stathmopodid moth larvae can consume nearly 70% of mature sporangia (Sawamura *et al.*, 2009). Among the Korean lepidopterans, feeding on fern spores has been reported only from *Psychoides gosari* Kim et Bae in Tineidae (Kim and Bae, 2007).

A gelechioid family, Stathmopodidae comprises 44 genera and 408 species worldwide (Nieukerken *et al.*, 2011). The members of the family can be recognized by the presence of the abdominal terga with spiniform setae on the posterior margins (Hodges, 1998) and their monophyly was substantiated by molecular data (Sohn *et al.*, 2016). The larvae are feeding on the inside of fruits and flowers of seed-plants or rarely, on fern spores. Fern spore-feeding has been known in a few stathmopodid genera including *Calicotis*, *Cuprina*, *Pachyrhabda*, *Stathmopoda*, *Thylacosceles*, and *Thylacosceloides* (Sohn *et al.*, 2016; Terada, 2016; Shen and Hsu, 2020; Fuentes-Jacques *et al.*, 2022). Of them, the genus *Cuprina* has been known in Korea (Koo *et al.*, 2018). The present study reports *Calicotis* for the first time from Korea.

## MATERIALS AND METHODS

Specimens examined were obtained from my field works in the island Chujado in 2015 and 2018. Live larvae were collected with the host plants and reared in my laboratory. All research materials were deposited in two institutional collections: the Gongju National University of Education (GJUE) and the National Institute of Biological Resources (NIBR).

Selected specimens were dissected and slide-mounted, following Clarke (1941), except that chlorazol black and Euparal resin were used for staining and mounting medium, respectively. Terms for genitalia follow Terada (2016). The names of host plants follow the “Plant List” website ([www.theplantlist.org](http://www.theplantlist.org)).

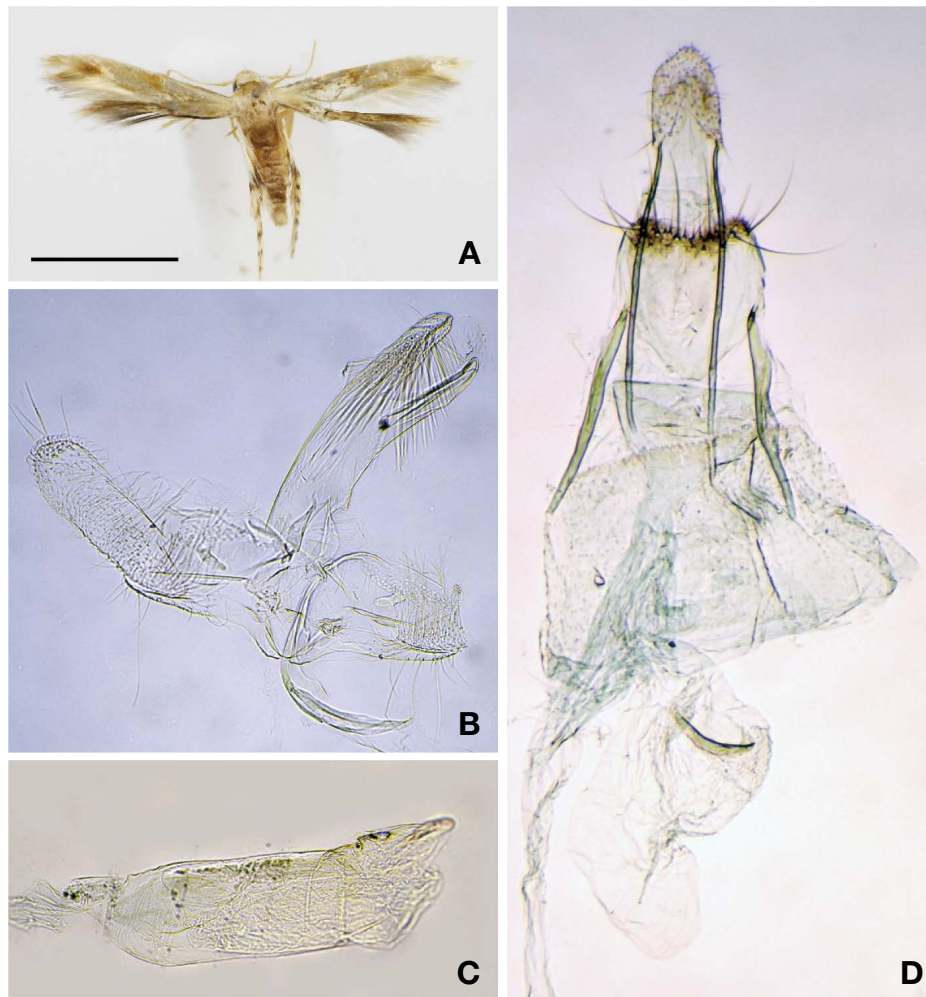
## TAXONOMIC ACCOUNTS

Family Stathmopodidae Meyrick, 1913

### *Calicotis* Meyrick, 1889

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

This genus was designated by Meyrick (1889) with the



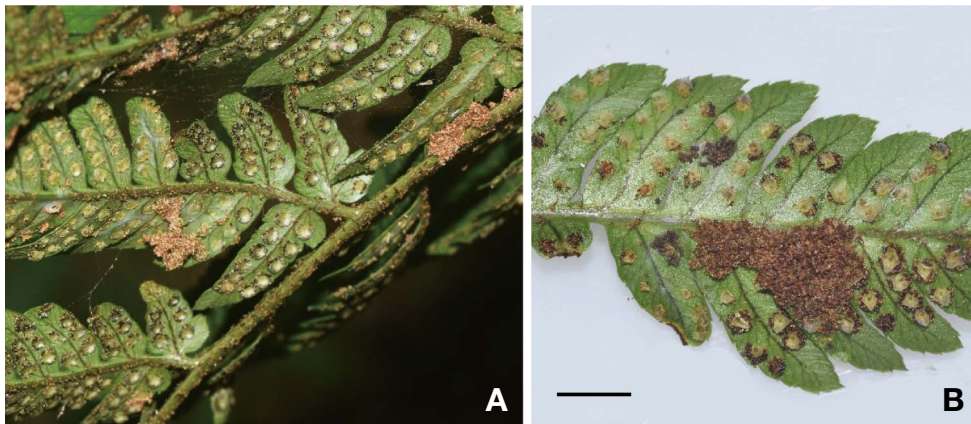
**Fig. 1.** *Calicotis latebrifica* Terada, 2016. A. habitus (female), scale bar = 3 mm, B. male genitalia, C. phallus, D. female genitalia.

type species, *Calicotis crucifera* Meyrick, 1889. It comprises 15 species occurring mainly in the East Asia and Australasian Region (Terada, 2016). The adult moths can be characterized by the presence of an eye-cap formed by the dilated antennal scape, the stout filiform flagellum, the developed costal ring in the male genitalia, the apophyses anteriores thicker than the apophyses posteriores, and the ductus bursae as long as or slightly longer than the antrum in the female genitalia (Guan and Li, 2015). The larvae, if known, are fern spore-feeders (Terada, 2016). Leather-leaf spore eaters (*Calicotis crucifera* Meyrick, 1889) are one of the representative moth species associated with fern spores, as they feed on the Leather-leaf fern (*Pyrrosia eleagnifolia*), a widespread climbing fern in the Australasian Region (Patrick, 2015).

***Calicotis latebrifica* Terada, 2016 (Figs. 1A – D, 2A, B)**  
 홀씨꼭지나방  
*Calicotis latebrifica* Terada, 2016: 137. Type locality:

Japan, Ryukyu Islands, Kikai Is.

**Description.** Habitus (Fig. 1A) - Head: Vertex lustrous, pale yellowish gray; frons and occiput lustrous, white. Labial palpus slender, white, intermixed with yellowish gray scales laterally. Antenna 4/5 as long as forewing, lustrous, pale yellowish gray. Thorax: Tegula white, intermixed with yellowish gray scales on basal half; mesonotum white. Forewing length ca. 4.2 mm, lustrous, white, tinged with dark brown on basal half of costa; median band, oblique, dark yellowish brown; tornal blotch dark yellowish brown; cilia pale fuscous. Hindwing very narrow, fuscous in distal half, pale gray in basal half; cilia pale fuscous. Male genitalia (Fig. 1B) - uncus stout, round apically, with downward, stiff setae dorsolaterally. Gnathos tongue-shaped, as long as uncus, narrowly-round apically. Tegumen narrow. Valva subrectangular in basal half, digitiform and densely setose in distal half; dorsal margin of costa convex in basal 1/6; sacculus sclerotized, round api-



**Fig. 2.** Larval shelters of *Calicotis latebrifica* Terada, 2016. A. shelters on *Dryopteris nipponensis* Koidz., B. an expanded shelter, scale bar = 5 mm.

cally. Phallus (Fig. 1C) stout, with apical patch of stimuli; cornutus absent. Female genitalia (Fig. 1D) - sternite VIII shield-shaped, concave distally, with sclerotized area and long setae along distal margin. Papillae anales tongue-shaped, slightly protruding dorsoapically, setose. Surrounding area of ostium bursae emarginated in bowl-shape. Ductus bursae short, dilated to corpus bursae; ductus seminalis long, dilated basally. Corpus bursae obovate, with signum on caudal 1/3; signum crescentiform.

**Material examined.** 1♂, Jeju Prov., Is. Chujado, 4 vi 2015, genitalia slide no.: SJC-1337, GJUE; 3♀, Jeju Prov., Chuja-myeon, Is. Sangchujado, Daeseo-ri, Mt. Bonggeulresan, 24 vii 2018 (JC Sohn), larvae on *Dryopteris nipponensis* Koidz., adults emerged on 7–12 viii 2018, genitalia slide no.: SJC-1350, GJUE & NIBR.

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

**Host plants.** Dryopteridaceae - *Cyrtomium falcatum* (L. f.) C. Presl; *C. fortunei* J. Sm.; *Dryopteris nipponensis* Koidz. (this study; Terada, 2016).

**Remarks.** This species differs from another fern spore-associated stathmopodid species in Korea, *Cuprina fuscella* Sinev, 1988 in having whitish body and wings and ventrally-ciliate antennae. The larvae construct sheet-like shelters with spore debris and silk (Fig. 2A) on the underside of fern leaves. They feed on fern sporangia within their shelter and by doing so, expand it to include intact sori (Fig. 2B). When fully matured, they pupate within their nests.

## ACKNOWLEDGEMENTS

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