



Full Length Article

Cochylini Guenée, 1845 (Lepidoptera: Tortricidae) in Taiwan: One newly recorded genus and five newly recorded species

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ABSTRACT

Ten species of the tribe Cochylini of Taiwan are reviewed. One genus *Gynnidomorpha* Turner, 1916, and five species: *Cochylidia contumescens* (Meyrick, 1931), *C. oblonga* Liu & Ge, 2012, *Eupoecilia ingens* Sun & Li, 2013, *Gynnidomorpha permixtana* (Denis & Schiffermüller, 1775) and *G. pista* (Diakonoff, 1984) are newly recorded for Taiwan. Images of the all the adults and partial genitalia are provided, along with a table showing the distribution of the tribe Cochylini in Taiwan, China.

Introduction

The tribe Cochylini belongs to the subfamily Tortricinae in the family Tortricidae. Cochylini was erected by Guenée in 1845 for the type genus *Cochylis* Treitschke, 1829. Currently, about 1100 species are described worldwide (Gilligan et al., 2012). A vast majority of species in this tribe are significant pests of crops, fruit and forest trees, and have important economic significance in agroforestry. Prior to this study, five species in two genera are distributed in Taiwan (Kawabe et al., 1992; Heppner, 2012).

The aim of the present paper is to review the tribe Cochylini from Taiwan, and to report one newly recorded genus and five species. A synonymies, geographical distribution and the collection information of each species are provided.

Material and methods

The studied specimens of Cochylini from Taiwan are deposited in the National Museum of Natural History, Washington DC, USA (USNM), the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, Florida, USA (MGCL), and/or the Insect Collection of Nankai University, Tianjin, China (NKU). Terminology for morphological structures follows Razowski (2009). Genitalia were prepared and mounted according to the methods introduced by Li (2002). Images of the adults were taken with a Leica S6D stereomicroscope, plus a Photomontage 2.0 System. Also, the genitalia were taken with a Leica DM1000 LED microscope.

Taxonomic accounts

The tribe Cochylini is reviewed in Taiwan, with three genera and ten species treated. Here, we give a brief introduction to each genus and each species. And a table is provided to show the distribution of tribe Cochylini in Taiwan (Table 1).

Aethes Billberg, 1820

Aethes Billberg, 1820: 90. Type species: *Pyrallis smeathmanniana* Fabricius, 1781.

Lozopera Stephens, 1829: 191. Type species: *Pyrallis francillana* Fabricius, 1794.

Phelonia Stephens, 1834: 177. [misspelling of *Phalonia*].

Chrosis Guenée, 1845: 300. Type species: *Tortrix decimana* Denis & Schiffermüller, 1775.

Loxopera Agassiz, 1848: 624. [unjustified emendation of *Lozopera*].

Argyridia Stephens, 1852: 83. Type species: *Tinea dipoltella* Hübner [1796–1836].

Argyridea: Waterhouse, 1902: 31. [misspelling of *Argyridia*].

Coecaethes Obraztsov, 1943: 99. Type species: *Loz opera mauritanica* Obraztsov, 1943. [subgenus of *Lozopera*].

Cirriaethes Razowski, 1962: 392. Type species: *Lozopera mauritanica* Walsingham, 1898.

Aethes Billberg, 1820 can be easily distinguished by the erect and slender socius (Sun and Li, 2013a: 457). Totally 146 described species of *Aethes* are distributed worldwide, mainly in the Holarctic Region (Sun and Li, 2013a). In Taiwan, only one species has been reported.

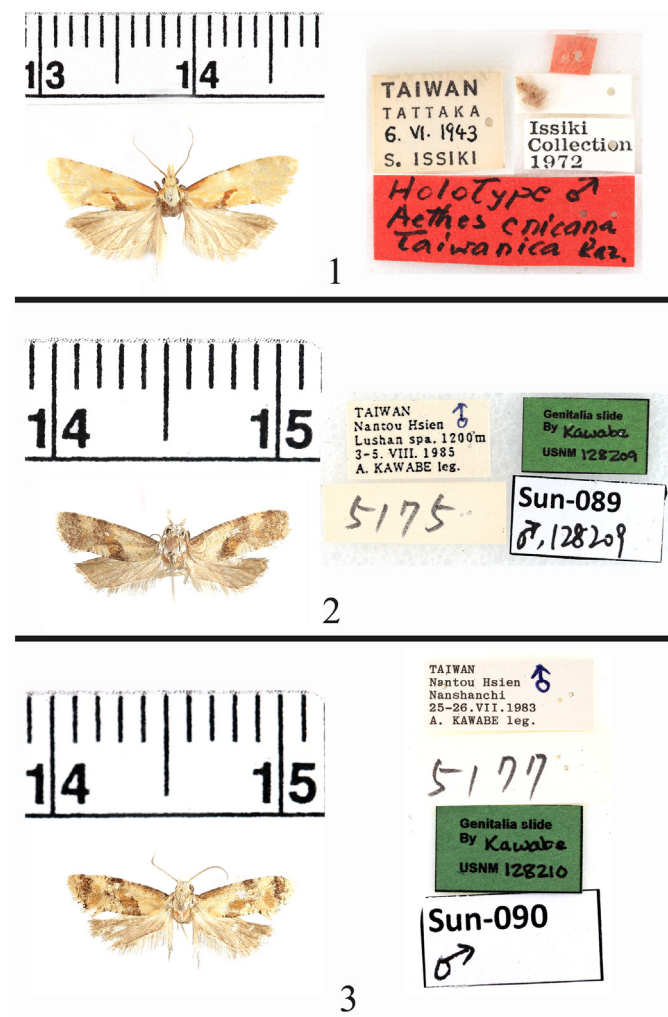
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Table 1

The distribution of tribe Cochylini in Taiwan.

	Chiayi	Hsinchu	Hualien	Ilan	Kaohsiung	Miaoli	Nantou	Pingtung	Taichung	Taipei	Taoyuan
<i>Aethes cnicana taiwanica</i>			•				•				
<i>Cochylidia altivaga</i>							•				
<i>C. contumescens</i>				•		•	•				
<i>C. oblonga</i>							•				
<i>Eupoecilia ambiguella</i>	•	•	•	•	•	•	•		•	•	•
<i>E. ingens</i>				•							
<i>E. kobeani</i>	•		•	•			•		•	•	
<i>E. wegneri</i>			•		•		•		•	•	
<i>Gymnidomorpha permixtana</i>										•	
<i>G. pista</i>								•			

Aethes cnicana taiwanica Razowski, 1977 (Fig. 1)*Argyrolepis cnicana* Westwood, 1854: 280. TL: Great Britain (Epping, Yaxley Fen). TD: BMNH.*Phalonia arcticana* Brandt, 1937: 71. TL: Finland. Holotype (♀): Brandt Collection.*Aethes cnicana* (Westwood): Razowski, 1970: 309.*Aethes cnicana* ssp. *taiwanica* Razowski, 1977a: 37. TL: Taiwan (Tattaka), Holotype (♂): USNM.**Material examined.** Holotype: ♂, Tattaka, 6-VI-1943 (Fig. 1). [USNM].**Figs. 1–3.** Adults of *Aethes* and *Cochylidia* spp. 1. *A. cnicana taiwanica*, ♂; 2. *A. contumescens*, ♂; 3. *C. oblonga*, ♂.Additional material. **Taiwan:** 4 ♂♂, 4 ♀♀, NanTowCo. Tayuling, 2500 m, 9–18 vi 1980 (D. R. Davis); 2 ♂♂, 1 ♀, NanTowCo. Mei-feng, 30 km S Tayuling, 2200 m, 1–8 vi 1980 (D. R. Davis) (Sun-088 ♂). [USNM]; 1 ♂, 4 ♀♀, Nantou Co. Tayuling, 2570 m, 5–9 vi 1982 (J. Heppner). [MGCL].**Distribution.** China (Taiwan), Korea, Japan, Russia.*Cochylidia Obratzov, 1956**Cochylidia Obratzov, 1956*: 14. Type species: *Tortrix subroseana* Haworth, [1811].*Cochylidia Obratzov, 1956* is characterized by the erect costal arm of the valva with tiny distal spines (Sun and Li, 2012: 2). It consists of 11 valid species divided into two groups (the *rupicola* group and the *subroseana* group), occurring in the Palearctic and Oriental regions. Only one species has been recorded in Taiwan prior to this study (Kawabe et al., 1992). We report two species as new for Taiwan, belonging to the *rupicola* group.*Cochylidia altivaga* Diakonoff, 1976*Cochylidia altivaga* Diakonoff, 1976: 5. TL: Nepal (Prov. Chisapani Garhi). Holotype: ZSM.**Material examined.** **Sichuan:** 1 ♂, Zhubalong Town, Batang County (30°00'N, 99°09'E), 2500 m, 10 vii 2001 (Houhun Li & Xinpu Wang). **Gansu:** 1 ♂, Bifenggou, Wen County, 860 m, 14 vii 2005 (Haili Yu) (genitalia slide no.: ZAH03416 ♂, ZX06117 ♂). [NKU]**Distribution.** China (Gansu, Sichuan, Taiwan), Nepal.**Remarks.** Kawabe et al. (1992) recorded this species in Taiwan, but we failed to find it in the examined specimens collected from Taiwan. Instead, we examined two specimens collected from Mainland China (Sun and Li, 2012: 3).*Cochylidia contumescens* (Meyrick, 1931) (Figs. 2, 10, 14)*Phalonia contumescens* Meyrick, 1931: 157. TL: Japan (Hokkaido, Sapporo). Holotype: BMNH.*Cochylidia contumescens* (Meyrick): Razowski, 1970: 376.**Material examined.** **Taiwan:** 1 ♀, Taihoku, 6 v 1935 (S. Issiki); 1 ♀, Suiryuto, 14 vii 1935 (S. Issiki); 1 ♂, 1 ♀, Nantou Hsien, Lushan spa, 1200 m, 3–5 viii 1985 (A. Kawabe) (Sun-089 ♂, USNM128209, dissected by Kawabe; USNM128207 ♀, dissected by Kawabe); 2 ♂♂, 2 ♀♀, Nantou Hsien, Nanshanchi, 25–26 vii 1983 (A. Kawabe); 1 ♂, Nantou Hsien, Yushih, 1700 m, 3–4 viii 1987 (A. Kawabe); 1 ♀, Miaoli Hsien, Hernglong Lodge, nr Taian spa, 550 m, 8 viii 1983 (A. Kawabe); 1 ♂, Nantou Hsien, Lushan spa, 1200 m, 9–10 viii 1987 (A. Kawabe); 1 ♂, Taiwan, Suiryuto, 14 vii 1935 (S. Issiki). [USNM]; 1 ♂, Ilan Co. 5 km N. Nanao, 100 m, 11–13 x 1984 (J. Heppner & H. Wang) (TORT11859 ♂, no abdomen). [MGCL].**Distribution.** China (Anhui, Guangxi, Henan, Taiwan, Tianjin), Korea, Japan, Russia.

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