



## Descriptions of two new species of *Fibuloides* Kuznetsov, 1997 (Lepidoptera: Tortricidae: Eucosmini) from Thailand

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### Abstract

Two new species of genus *Fibuloides*, *F. baeriana* Siraphattarathamrong and Pinkaew, **n. sp.**, and *F. falcatus* Siraphattarathamrong and Pinkaew, **n. sp.**, are described from Thailand. Adults and genitalia are illustrated. The two new taxa increase the number of described *Fibuloides* species in Thailand to 17.

**Key words:** Lepidoptera, Tortricidae, Olethreutinae, Eucosmini, *Fibuloides*, Thailand

### Introduction

The genus *Fibuloides* was established by Kuznetsov with *F. modificana* from south Vietnam as the type species (Kuznetsov 1997). Species of *Fibuloides* are mainly brownish moths, small to medium in size. The genus is characterized by the follows features of wing venation: forewing with R<sub>4</sub> and R<sub>5</sub> stalked, with the base of R<sub>3</sub> close to this stem; CuA<sub>1</sub> strongly curved and originating near the base of M<sub>3</sub>; and hindwing with M<sub>3</sub> and CuA<sub>1</sub> stalked (Horak 2006; Kuznetsov 1997). *Fibuloides* currently includes 30 described species occurring throughout the Australian, Oriental, and Palearctic regions, with the greatest species richness recorded from Southeast Asia, where 17 species are known (Jaikla *et al.* 2013).

Fifteen species of *Fibuloides* were recorded from Thailand: *F. cyanopsis* (Meyrick), *F. corinthia* (Meyrick), *F. euphlebica* Kawabe, *F. japonica* Kawabe, and *F. macrosaris* (Meyrick) reported by Kawabe (1989); *F. bicucullus* (Pinkaew), *F. vaneecae* (Pinkaew), and *F. munda* (Diakonoff) reported by Pinkaew *et al.* (2005); *F. khaonanensis* Pinkaew described by Pinkaew (2008); *F. geniculata* Pinkaew and Zhang and *F. khaoyai* Pinkaew and Zhang described by Pinkaew and Zhang (2012); and *F. tratensis* Jaikla and Pinkaew and *F. bulla* Jaikla and Pinkaew described by Jaikla *et al.* (2013). In this paper two additional species are described.

### Material and methods

Specimens used in this study are deposited in the Kasetsart Kamphaengsaen Insect Collection (KKIC). Adults were photographed with a Cannon DSLR 5D mark II camera and a 100 mm macro lens. Labial palpi were photographed through a Leica S8 APO stereomicroscope equipped with a Leica MC170 HD camera module. A Leica DM750 connected with an ICC50 HD camera module was used to examine and photograph genitalia preparations. Forewing length was measured from the outer edge of the tegula at the wing base to the outermost edge of the fringe scales at the apex. Methods of genitalia preparation were adapted from Common (1990). Terminology for forewing pattern and genitalic structures follows Horak (1991, 2006).

## Results

### *Fibuloides bacriora* Siraphattarathamrong and Pinkaew, n. sp.

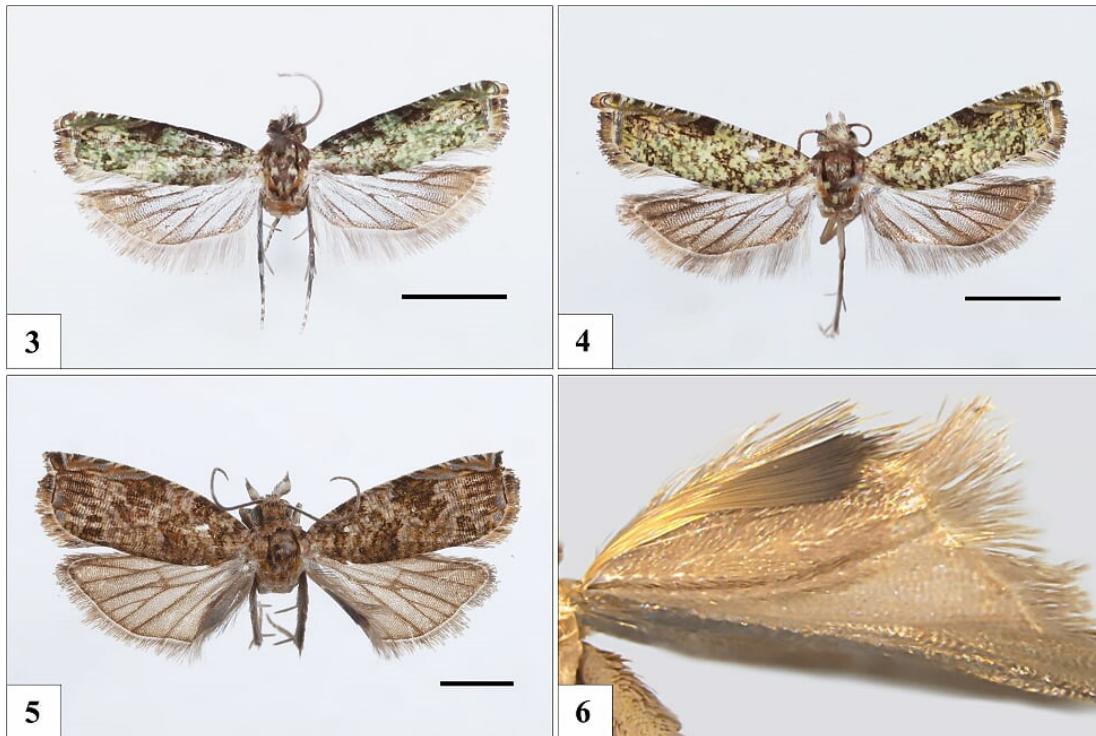
(Figs. 1, 3–4, 7–9, 13–15)

**Diagnosis.** This species is most similar to *Fibuloides macrosaris* in forewing pattern, but *F. bacriora* has a narrower forewing with more green in the ground color. The male genitalia of *F. bacriora* have a distinctly membranous socii and a large sclerotized plate of the gnathos that differs from all other species of *Fibuloides*.

**Description.** **Head** (Fig. 1): Upper frons light brown mixed with dark brown, lower frons yellowish white; labial palpus with first segment white to yellowish white, second segment dilated apically, light brown, ventral margin with white stripe, with distinct yellowish mark dorsoapically, apically dark brown, apical segment short, white, inner face of palpus white; vertex light brown mixed with brown; antenna brown with notch at base of flagellum.



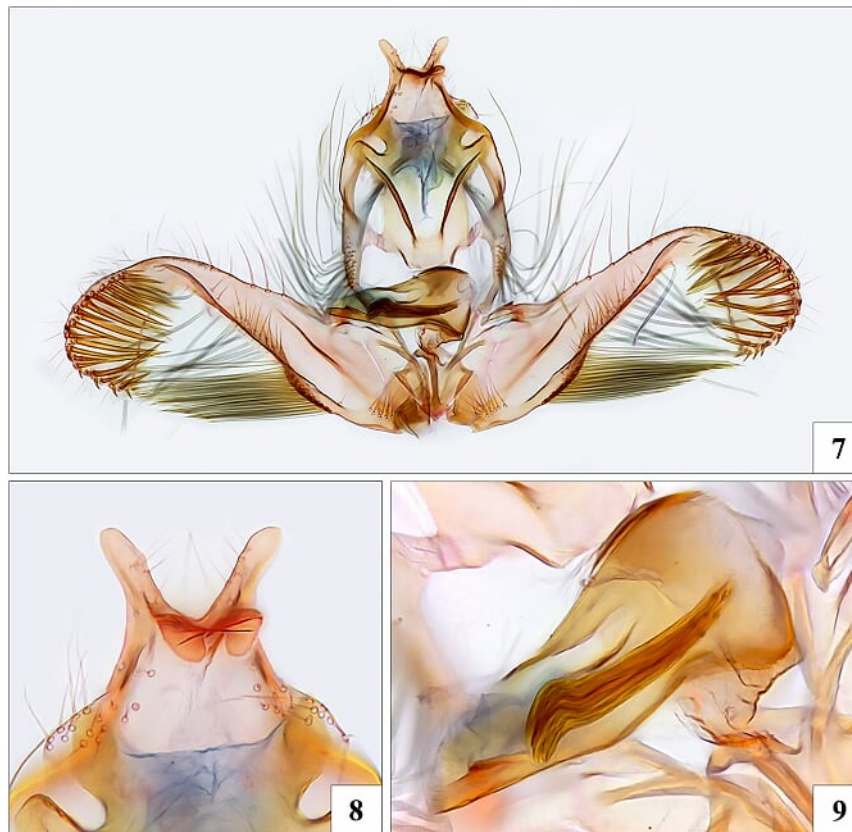
FIGURES 1–2. Head of *Fibuloides* spp. 1. *F. bacriora* (holotype male). 2. *F. falcatus* (holotype male).



FIGURES 3–6. Adults of *Fibuloides* spp. (scale bars = 2 mm.) 3. *F. bacriora* (holotype male). 4. *F. bacriora* (paratype female). 5. *F. falcatus* (holotype male). 6. *F. falcatus*, sex scales on the underside of anal margin of hindwing.

**Thorax:** Pronotal collar dark brown; tegula and mesonotum brown mixed with greyish green. Forewing (Figs. 3–4) length 4.1–4.2 mm in male ( $n = 2$ ), 3.7–3.8 mm in female ( $n = 3$ ); rectangular, costa slightly curved, termen concave below apex, costal fold absent; ground color greenish white, slightly darker apically, diffusely mottled

with brown; costal strigulae white separated by blackish streak, well developed along costa in female, male with distinct costal strigulae in apical half, basal half indistinct with dark brown stripe along costa from near wing base to middle of costa, basal 1/3 with indistinct transverse brown band extending outward from costa to Cu then backward to dorsum, middle of costa with large dark brown trapezoidal mark, beyond with two oblique greenish grey stripes, one extending from costa to  $R_3$  and  $R_4$ , other extending to  $R_5$  near termen, with greenish white stripe along termen from below apex to  $CuA_1$ , with narrow blackish line near termen extending from  $R_5$  to between  $M_1$  and  $M_2$ ; underside light brown except dorsal half dark brown, with grey spots along costa apically. Hindwing light brown, basal 2/3 more hyaline, covered with moderately dense scales, slightly paler near wing base; underside light brown.



**FIGURES 7–9.** Morphological features of male genitalia of *Fibuloides bacriora* (holotype). 7. Male genital capsule 8. Extension of uncus and membranous socii (arrow) 9. phallus.

**Abdomen:** Male genitalia (Figs. 7–9) with tegumen moderately sclerotized, with group of dense scales basally, with sclerotized shoulders; uncus rather short, bifid, with blunt apices, inner margin sparsely setose, medially with protruding process, bilobed, rounded apices pointing ventrally; socii membranous with moderately dense setae; gnathos arising from basal 2/3 of tegumen, joined medially, forming a large, moderately sclerotized plate, extending upward, connected to tegumen shoulder, with two divergent sclerotized ridges; juxta subtriangular; caulis short; anellus surrounding base of phallus; phallus moderately long, with dense cornuti; valva with long, sparsely setose on dorsal margin medially; sacculus with moderately dense setae basally, ventrolateral area with narrow patch of dense, short setae, outer surface with a series of dense, long, spiniform setae, bidentate apices, neck narrow and curve; cucullus scoop-shaped, bent at base, with rounded apex pointing ventrally, with dense patch of long and short spines, dorsal margin with sparse short setae. Female genitalia (Figs. 13–15) with papillae anales densely setose. Tergum VIII without scales, lateral triangular extension with moderately dense scale sockets and sparse setae. Sternum VII moderately sclerotized, posterior margin moderately excavation, medially fused with widened lamella postvaginalis, densely microtrichiate, posterolaterally with dense scales sockets, anterolaterally with patch of densely microtrichiate; ostium bursae located on sternum VII close to anterior margin, sterigma fused with sternum VII forming incomplete subtrapezoidal ridge, beyond laterally on each side with long, sclerotized, oblique ridge; ductus bursae shorter than corpus bursae; colliculum two small, lateral sclerotized below ostium;

anterior half with a sclerotized plate, prong-shaped with arm tapering and tip reaching beyond bursae neck; ductus seminalis arising at base of prong; corpus bursae ovate with two unequal horn-shape signa.

**Holotype.** ♂. Thailand, Nakhon Nayok; Khao Yai N.P., Pha Deaw Dai, 14°21'56"N, 101°24'24"E, ca. 1,140 m, Hill Evergreen forest, 5 July 2016, N. Pinkaew *et al.*, np 8995; genitalia slide no. NP 3077. Deposited in KKIC.

**Paratypes.**: 1♂, 3♀, Thailand: Nakhon Nayok, Khao Yai N.P., Pha Deaw Dai, 14°21'56"N, 101°24'24"E, ca. 1,140 m, Hill Evergreen forest, 5 July 2016, N. Pinkaew *et al.*, np 9005, ♂ genitalia slide NP 3184. Nakhon Nayok, Khao Yai N.P., 14°25'55"N, 101°24'05"E, ca. 700 m, 7 July 2016, np 8906, ♀ genitalia slide NP 3083. Chiangmai, Doi Suthep-Pui N.P., 18°48'41" N, 98°53'03" E, ca. 1,264 m, 5 September 2013, np 5959, ♀ genitalia slide NP 2082. Kanchanaburi, Thong Pha Phum N.P., 14°41'27" N, 98°27'29" E, ca. 730 m, 10 July 2002, np 743, ♀ genitalia slide NP 526. All deposited in KKIC.

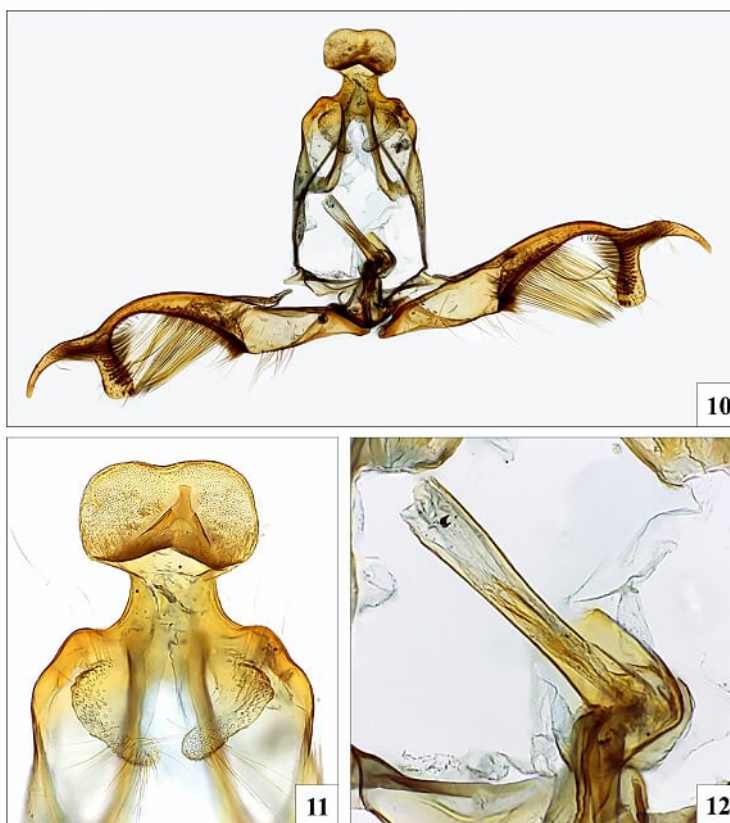
**Distribution.** Thailand (Nakhon Nayok, Chiangmai, Kanchanaburi).

**Etymology.** The specific name is derived from Latin *bacrio* (= long handle, dipper, ladle), referring to the shape of the cucullus.

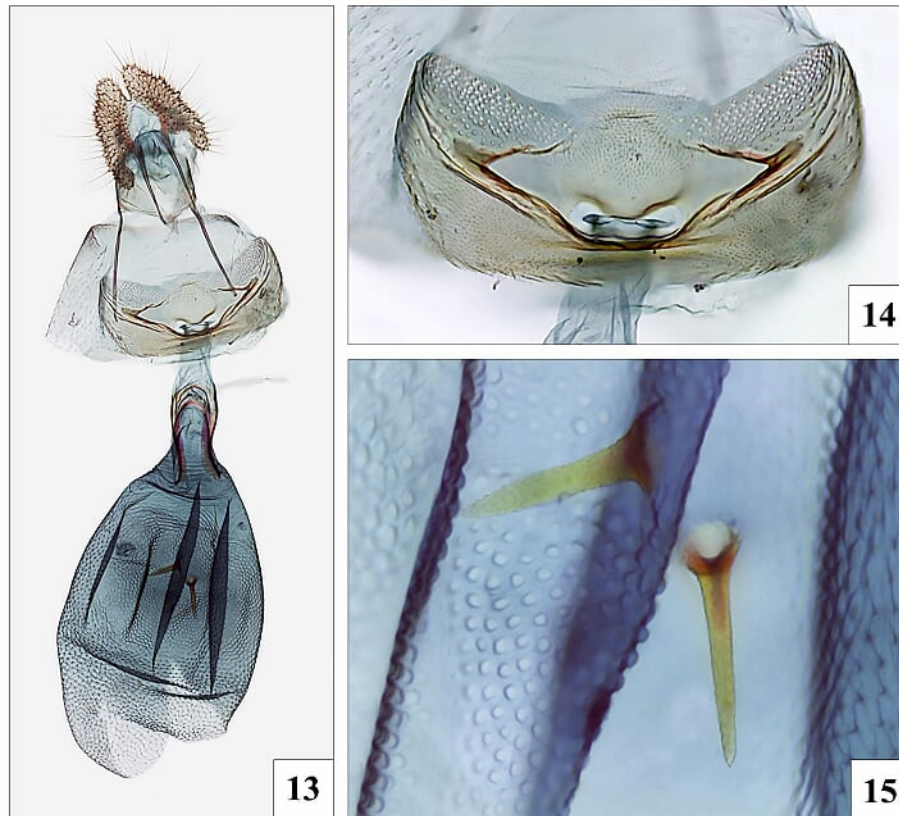
### *Fibuloides falcatus* Siraphattarathamrong and Pinkaew, n. sp.

(Figs. 2, 5–6, 10–12)

**Diagnosis.** This species is most similar to *Fibuloides vanevae* in forewing pattern, but it differs in the shape of the uncus and cucullus in the male genitalia. The broad uncus and the sickle-shape cucullus of *F. falcatus* contrast with the slender, deeply bifid uncus and the long and narrow cucullus of *F. vanevae*.



**FIGURES 10–12.** Morphological features of male genitalia of *Fibuloides falcatus* (holotype). **10.** Male genital capsule. **11.** Uncus, socii and gnathos. **12.** Phallus.



**FIGURES 13–15.** Morphological features of female genitalia of *Fibuloides bacriora* (paratype). **13.** Female genital capsule. **14.** Ostium and sterigma. **15.** Signa.

**Description. Head** (Fig. 2): Upper frons light brown mixed with brown, lower frons yellowish white, light brown laterally; labial palpus with first segment white, second segment dilated apically, yellowish white, with dark brown at base, medially with transverse brown band, apicomediaally with dark brown mark, apical segment slender, yellowish white with dark brown basal half.

**Thorax:** Pronotal collar brown mixed with dark brown; tegula brown, basal half mixed with dark brown; mesonotum brown, with transverse dark brown band medially. Forewing (Figs. 5–6) length 5.6 mm in male ( $n = 1$ ); costa evenly curved; costal strigulae well developed, greyish white separated by dark brown streak; termen concave below apex, male costal fold absent; ground color light brown with dark brown striae, basal patch irregular, brown mixed with dark brown; median fascia dark brown, extending obliquely from costa to base of  $R_5$ , margins irregular, beyond with four striae extending obliquely from costa to  $R_5$ , grey alternated with orange brown, apical 1/5 with irregular blackish scaling along wing venation of  $R_5$  to  $CuA_1$ ; termen with brown to dark brown line between  $R_5$  and  $CuA_1$ , pretornal area with dark brown subtriangular mark extending from dorsum to between  $M_3$  to  $CuA_1$ ; underside light brown with greyish white spots along costa. Hindwing light brown, anal margin moderately sclerotized with group of long, light brown hair pencils beneath, originating from wing base, underside light brown.

**Abdomen:** Male genitalia (Figs. 10–12) with tegumen subrectangular, moderately sclerotized, basal 2/3 with dense scale sockets, with pronounced sinuate shoulders; uncus moderately large, basal half narrower with moderately dense scale sockets, apical half larger, widened bilobed with rounded apices, with shallow excavation dorsomedially, ventral margin with distinct V-shaped excavation, with protruding sclerotized subtriangular process, pointing upward; socii subtriangular, pendant ventrally, arising from base of uncus, ca. 1/4 length of tegumen with rounded apices, densely setose; arms of gnathos moderately sclerotized, weak at base, extending upward; juxta subtriangular; caulis short; anellus surrounding base of phallus; phallus moderately long, without cornuti; valva long and slender; sacculus with moderately dense scale sockets ventromedially, ventral margin with sparse long setae, with dense short setae medially from near basal excavation margin to near neck, ventrolateral margin with a

row of short setae from angle of sacculus toward neck, outer surface with a series of long spiniform setae toward neck; neck narrow and curved, with sparse short setae on ventral margin; cucullus incised medioapically forming two lobes, dorsal lobe crescent-shaped with pointed apex, densely setose basally, ventral lobe larger, slightly widened toward rounded apex, densely setose except outer margin and apex.

**Holotype.** ♂. Thailand: Chiangmai; Doi Suthep-Pui N.P., Pha Dum, 18°45'33"N, 98°53'28"E, ca. 1,412 m, Hill Evergreen forest, 6 September 2013, N. Pinkaew *et al.*; np 6010, genitalia slide no. NP 3743. Deposited in KKIC.

**Distribution.** Thailand (Chiangmai).

**Etymology.** The specific name is derived from Latin *falcatus* (= sickle-shape), referring to the shape of the cucullus.

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