

CORRESPONDENCE

Genus *Cathyalia* Ragonot, 1888 (Lepidoptera: Pyralidae), new record phycitine to China

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Abstract The genus *Cathyalia* Ragonot, 1888 and three species *C. fulvella* Ragonot, 1888, *C. okinawana* Yamanaka, 2003 and *C. pallicostella* Roesler & Küppers, 1981 are newly recorded from China. A key and photographs of adults and genitalia of the three species are provided.

Key words Lepidoptera, Pyralidae, Phycitinae, *Cathyalia*, new record, China.

The genus *Cathyalia* was established by Ragonot in 1888. It currently contains seven species that mainly distributed in the Oriental and Australian Regions: *C. fulvella* Ragonot, 1888 (Australia, Brunei, India, Indonesia, Malaysia, Papua New Guinea, Solomon Islands, Sri Lanka, and Thailand), *C. pallicostalis* (Walker, 1863) (Australia and India), *C. edidiehlia* Roesler & Küppers, 1981 (Indonesia), *C. gisela* Roesler & Küppers, 1981 (Indonesia), *C. pallicostella* Roesler & Küppers, 1981 (Indonesia), *C. okinawana* Yamanaka, 2003 (Japan) and *C. nishizawai* Yamanaka, 2004 (Japan) (Roesler & Küppers, 1981; Roesler, 1983; Yamanaka, 2003, 2004, 2006).

In this study, we report the genus *Cathyalia* and three species *C. fulvella*, *C. okinawana* and *C. pallicostella* for the first time in China, and provide a key and photographs of adults and genitalia to the three Chinese species.

This study is based on the examination of specimens collected by light traps from forests and mountains in China. Genitalia dissection and mounting methods follow Li & Zheng (1996) and Li (2002). The photographs of the adults and venations were taken with Leica M205A, and photographs of the genitalia and details of head were taken with a Leica DM750, with Leica Application Suite 4.6 software to capture images. All specimens examined are deposited in the Insect Collection, College of Life Sciences, Nankai University, Tianjin, China (NKUM) and the Insect Collection, Institution of Plant Protection, Henan Academy of Agricultural Sciences, Zhengzhou, China (HAASM), respectively.

***Cathyalia* Ragonot, 1888**

Cathyalia Ragonot, 1888: 7; Roesler & Küppers, 1981: 15; Roesler, 1983: 78; Robinson, Tuck & Shaffer, 1994: 159; Shaffer, Nielsen & Horak, 1996: 177. Type species: *Cathyalia fulvella* Ragonot, 1888.

General characters. Vertex flat, with rough scales. Antenna simple and shortly pubescent on both sexes. Ocellus present. Chaetosema well developed. Labial palpus upturned beyond head, with third segment slightly shorter than second, apex pointed. Maxillary palpus short, no longer than second segment of labial palpus. Proboscis well developed. Forewing with R₂ and R₃₊₄+R₅ close at base or shortly stalked, R₃₊₄ and R₅ stalked for about half length of R₅, M₂ close to M₃ at base, from lower angle of cell, CuA₁ and CuA₂ free; cell about 2/3 length of forewing. Hindwing with Rs and Sc+R₁ long-stalked, M₁ and Sc+Rs+R₁ stalked for 2/5 of M₁, M₂ and M₃ close at base, from lower angle of cell, CuA₁ and CuA₂ free; cell very short, only 1/5 length of hindwing.

Male genitalia. Uncus bell-shaped. Apical process of gnathos small, triangular or clubbed, with a small hook distally.

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Transtilla fused, usually a narrow arched band. Valva with clasper; costa and sacculus strongly sclerotized, extended to end of valva. Vinculum U-shaped, longer than width. Juxta usually U-shaped, lateral lobes various in shape, globular or finger like, or fused and extremely extended to middle of uncus. Aedeagus slender, with one sinuate sclerite; cornuti a cluster of spines or thorns. Culcita present.

Female genitalia. Anal papillae triangular. Eighth abdominal segment short and wide, collar-shaped. Apophyses anteriores and posteriores short, nearly equal in length. Antrum rectangular. Ductus bursae mostly sclerotized. Corpus bursae membranous, elongate elliptic. Signa usually comprised of a transverse row of flag-shaped or conical spines. Ductus seminalis incepted at junction of ductus bursae and corpus bursae.

Distribution. China, Japan, Thailand, Malaysia, Indonesia, Brunei, India, Sri Lanka, Australia, Papua New Guinea.

Key to Chinese *Cathyalia* species (based on male genitalia).

1. Forewing with a broad white streak from basal 1/5 to apex along costa (Figs 1, 5); transtilla without process, clasper simple in the male genitalia; ostium at intersegmental membrane between seventh and eighth segments, ductus bursae without thorn in female genitalia 2
Forewing without broad white streak along costa (Fig. 3); transtilla with three short processes on posterior margin, clasper complex in the male genitalia (Fig. 8); ostium at center of seventh segment, ductus bursae with two sharp thorns posterolaterally in female genitalia (Fig. 11) *C. fulvella*
2. Labial palpus with terminal two segments about equal length (Fig. 1a); apical process of gnathos small triangular, juxta with lateral lobes fused and extremely extended to middle of uncus in male genitalia (Fig. 7); ductus bursae about half length of corpus bursae, strongly sclerotized except with a narrow membranous ring at 1/3, corpus bursae not scobinate in female genitalia (Fig. 10)
..... *C. okinawana*
Labial palpus with second segment about 2.2 times length of third segment (Fig. 5a); apical process of gnathos long clubbed, juxta with lateral lobes separated, not extended backward in male genitalia (Fig. 9); ductus bursae about same length of corpus bursae, sclerotized in posterior 4/5, membranous in anterior 1/5, corpus bursae scobinate posterolaterally in female genitalia (Fig. 12)
..... *C. pallicostella*

***Cathyalia okinawana* Yamanaka, 2003 new record to China (Figs 1–2, 7, 10)**

Cathyalia okinawana Yamanaka, 2003: 113.

Adult (Figs 1–2). Wingspan 15.5–20.5 mm. Vertex and frons yellowish white. Antenna with scape white, flagellum fuscous dark or mixed with grayish brown. Labial palpus (Fig. 1a) with basal segment white, terminal two segments about equal length, yellowish white on inner side, pale yellowish brown on outer side. Maxillary palpus yellowish white. Tegula and patagium pale yellowish brown; thorax blackish brown tinted with ochreous brown. Forewing grayish brown mixed with rusty brown, rusty brown along venation; a broad white streak from basal 1/5 to apex along costa, about 1/3 width of forewing; antemedial line grayish white, narrowed, indistinct, from basal 1/5 of costa oblique outward to 2/5 of dorsum, forming a somewhat conspicuous grayish white spot on dorsum; discal spots obscure, white, confluent in crescent shape; postmedial line from near apex inwardly oblique to 1/4 of dorsum, represented by several white spots, conspicuous near dorsum; terminal line black; cilia blackish brown. Hindwing grayish white, grayish brown along termen and venation; cilia grayish brown. Legs white, with scattered brown scales, base of femur and tibia blackish brown, tarsus blackish brown. Abdomen brown fuscous, yellowish white along longitudinal middle of basal four segments.

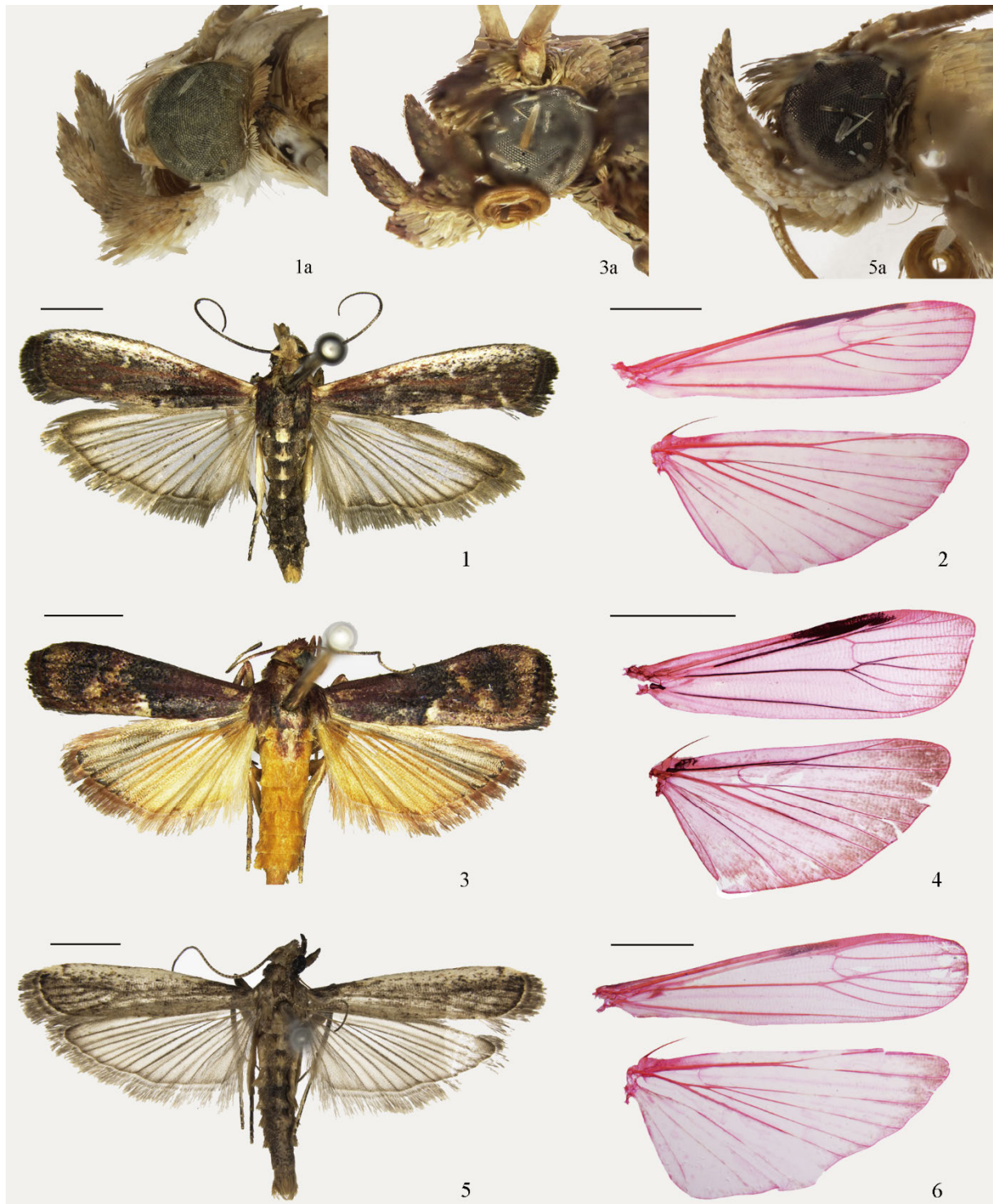
Male genitalia (Fig. 7). Uncus bell-shaped or tubular, with length longer than width, apex rounded. Apical process of gnathos very short, triangular. Transtilla a narrow arched band. Valva moderate in width, terminal margin oblique, slightly concaved; costa slightly broad at base, then gradually narrowed to apex, protruded at basal 1/4; clasper long-narrow triangular, from basal 1/5 of valva near costa obliquely extended to protuberance of costa, then stretched to end of valva along costa; sacculus clubbed, about 3/4 length of valva, apex blunt, shallowly separated from valva. Vinculum 1.3 times as long as wide. Juxta long-neck flask shaped, roundly inflated basally; lateral lobes fused and extremely extended to middle of uncus. Aedeagus slender, about 0.7 times length of valva; cornuti a sinuate sclerite in basal half and a row of small thorns in distal half. Culcita two pairs.

Female genitalia (Fig. 10). Ostium about 1/4 width of antrum. Antrum broad, rectangular, width twice longer than length, rounded at angles. Ductus bursae strongly sclerotized, with a narrow membranous ring near anterior 2/5, anterior 2/5 slightly broadened, posterior 3/5 narrowed. Corpus bursae elongate, oval, twice length of ductus bursae. Signa comprised of 6 to 12 flag-shaped sclerites located at sclerotized ovate plates, transversely arranged in posterior 2/5 of corpus bursae.

Material examined. Zhejiang, 3♂(NKUM); Fujian, 2♂5♀ (NKUM); Hubei, 1♂ (NKUM); Guangdong, 2♂4♀ (NKUM); Guangxi, 18♂21♀ (NKUM); Hainan, 29♂13♀ (NKUM), 35♂31♀ (HAASM); Guizhou, 9♂17♀ (NKUM), 11♂18♀ (HAASM); Yunnan, 48♂22♀(NKUM), 19♂13♀ (HAASM).

Distribution. China (Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Yunnan, Zhejiang), Japan, Indonesia.

Variation. In some individuals, the uncus of the male genitalia is narrower, longer and tubular (Fig. 7b), the thorns in the aedeagus is fewer and stouter (Figs 7c–d). In the female genitalia, the amount of signa varies from 6 to 12 (Figs 10b–e), and in some individuals, the ductus bursae is slightly broadened in anterior 1/3, the narrow membranous ring is situated at anterior 1/3 of ductus bursae (Fig. 10a). As the interspecific differences in this genus are remarkable, the authors regard the above-mentioned variations as intraspecific variation.



Figures 1–6. *Cathyalia* spp., adults and venation. 1. *C. okinawana*, ♂ (a. head). 2. *C. okinawana*, venation, slide No. RYD20120098W. 3. *C. fulvella*, ♂ (a. head). 4. *C. fulvella*, venation, slide No. LJY10270. 5. *C. pallicostella*, ♂ (a. head). 6. *C. pallicostella*, venation, slide No. RYD20120149W.

***Cathyalia fulvella* Ragonot, 1888 new record to China** (Figs 3–4, 8, 11)

Cathyalia fulvella Ragonot, 1888: 7; Roesler & Küppers, 1981: 14; Roesler, 1983: 79; Robinson, Tuck & Shaffer, 1994: 159; Shaffer, Nielsen & Horak, 1996: 177.

Spatulipalpia erythrina Hampson, 1896: 103. Synonymized by Roesler & Küppers, 1981: 14.

Cryptoblabe rufimarginella Pagenstecher, 1900: 166. Synonymized by Shaffer, Nielsen & Horak, 1996: 177.

Trissonca clytopa Turner, 1947: 52. Synonymized by Shaffer, Nielsen & Horak, 1996: 177.

Adult (Figs 3–4). Wingspan 12.0–15.0 mm. Vertex yellowish brown, frons ochreous brown. Antenna with scape yellowish brown, flagellum yellowish brown to grayish brown. Labial palpus (Fig. 3a) with basal segment grayish white, terminal two segments about same length, pale yellow on inner side, grayish brown tinged with ochreous brown on outer side. Maxillary palpus yellowish brown. Thorax, tegula and patagium purplish brown. Forewing blackish brown, tinged with ochreous brown; markings indistinctive, antemedial line, discal spot, postmedial line obscure; a large, rounded-triangular patch on dorsum between antemedial and postmedial lines, colored yellowish white mixed with brown; an arched, yellowish brown stripe aside postmedial line, parallel with termen; terminal line black; cilia grayish brown. Hindwing pale orangey yellow, grayish yellow along costa till apex, orangey yellow along veins; cilia orangey yellow. Foreleg with coxa yellowish white on ventral surface, femur yellowish brown mixed with blackish brown, tibia and tarsus blackish brown; midleg and hindleg yellowish white on inner side, blackish brown on outer side, gray to dark red at end of each tarsal segment. Abdomen orangey yellow.

Male genitalia (Fig. 8). Uncus bell-shaped. Apical process of gnathos clubbed, 1.2 times length of uncus, hooked at apex. Transtilla n-shaped on anterior margin, with three short processes at middle and lateral sides of posterior margin. Valva broad in basal half, apical half about 1/2 width of basal half, apex rounded, densely setose in apical 2/5; costa slightly sinuate, triangularly protruded at basal 1/3, humped at basal 2/3; clasper well developed, presented as a smooth sclerite extending from basal 1/3 of costa to end of sacculus, then angled and outwardly stretched to apical 1/6 of valva along ventral margin, with a lobate, setose process at base; sacculus stout, clubbed, 3/5 length of valva, rounded-triangularly protruded near end. Vinculum 1.8 times as long as wide. Lateral lobes of juxta stout, with globular, setose apex. Aedeagus slender, about same length of valva; cornuti consisted of a twist sclerotized crimple at base, and three or four clusters of spinule distally. Culcita one pair.

Female genitalia (Fig. 11). Ostium at center of seventh segment, surrounded sections strongly sclerotized in flabellate shape. Antrum semicircular. Ductus bursae slightly broader, membranous, twist in anterior 1/3 slightly; narrowed, strongly sclerotized in posterior 2/3, with two slender lateral thorns at posterior margin in V shape. Corpus bursae elongate, oval, slightly longer than ductus bursae, crimped at junction with ductus bursae. Signa about 10 flag-shaped sclerites located at sclerotized ovate plates, obliquely arranged in posterior 2/5 of corpus bursae.

Material examined. Hainan, 4♂9♀ (NKUM); Yunnan, 2♂4♀ (NKUM).

Distribution. China (Hainan, Yunnan), Thailand, Malaysia, Indonesia, Brunei, India, Sri Lanka, Australia, Papua New Guinea.

***Cathyalia palliostella* Roesler & Küppers, 1981 new record to China** (Figs 5–6, 9, 12)

Cathyalia palliostella Roesler & Küppers, 1981: 17; Roesler, 1983: 80.

Adult (Figs 5–6). Wingspan 14.0–17.0 mm. Vertex and frons yellowish brown. Antenna with scape yellowish brown, flagellum yellowish brown and blackish brown. Labial palpus with basal segment yellowish white, terminal two segments pale yellowish brown on inner side, blackish brown on outer side, second segment about 2.2 times length of third segment. Maxillary palpus yellowish brown tinged with black. Tegula, patagium and thorax grayish brown. Forewing grayish mixed with blackish brown; a broad grayish white streak from basal 1/5 to apex along costa, about 1/4 width of forewing, scattered grayish brown scales; antemedial line and discal spots absent; postmedial line obscure, grayish white, placed on distal 1/6, slightly oblique inward; terminal line blackish brown; cilia grayish brown. Hindwing gray; cilia grayish brown. Legs yellowish white, scattered blackish brown scales, tarsus blackish brown, with gray ring at end of each segment. Abdomen yellowish brown ventrally, grayish brown dorsally, yellowish white along longitudinal middle line of each segment.

Male genitalia (Fig. 9). Uncus bullet-shaped, length twice as long as width, apex narrowly rounded. Apical process of gnathos slender, clubbed, pointed at apex, about 3/4 length of uncus. Transtilla a narrow arched band. Valva narrowed at base, gently broadened to rounded apex, densely setose in apical 1/3; costa arched, strongly sclerotized on inner margin, narrowed at base, whereas slightly broadened from middle to apex; clasper spoon-shaped, from basal 1/4 near costa stretched toward apex of sacculus, rounded-triangularly expanded distally; sacculus 3/5 length of valva, spindle-shaped, rounded at end, densely setose. Vinculum elongate, twice as long as wide, tapered rounded anteriorly. Lateral lobes of juxta clubbed,

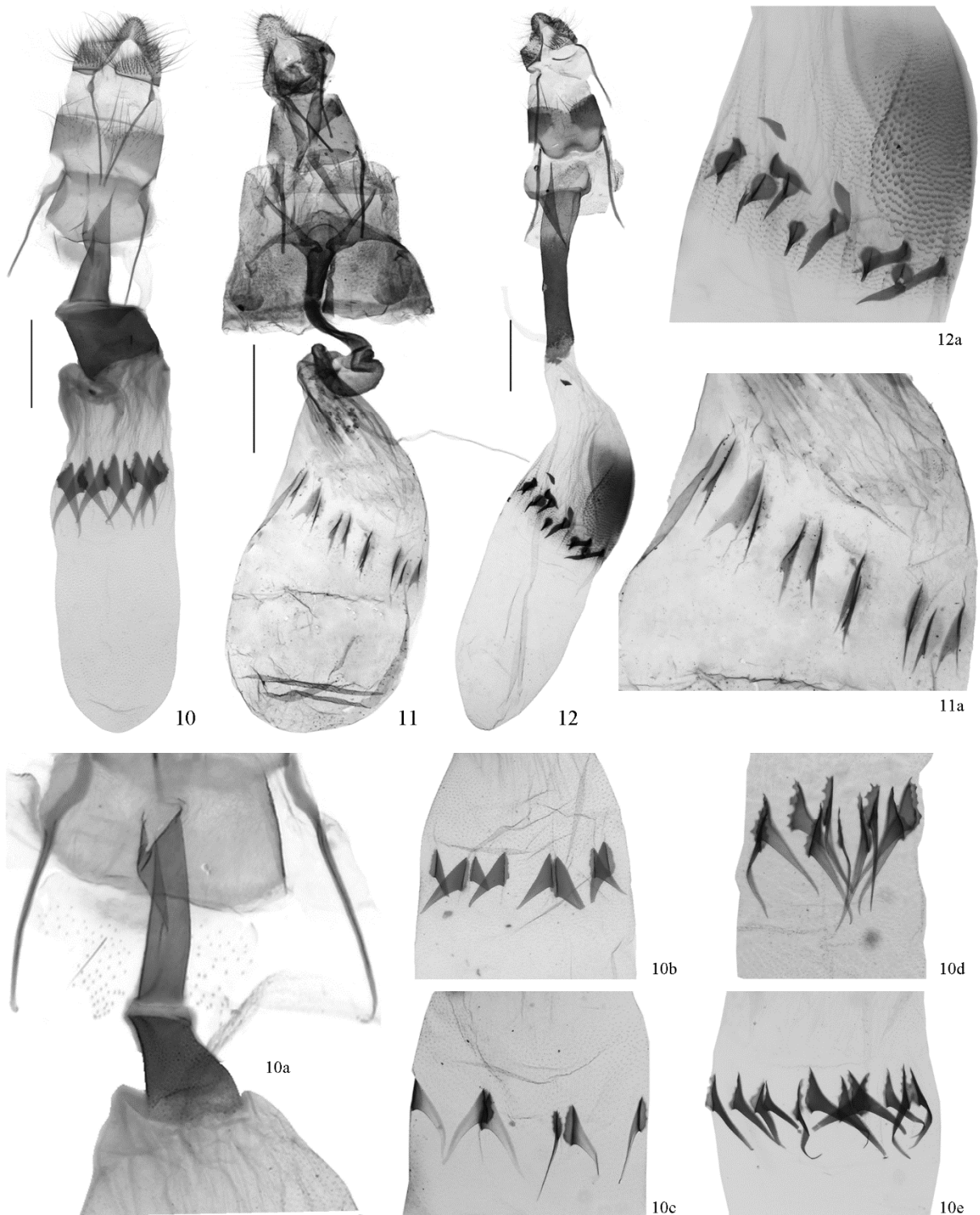
distally setose. Aedeagus slender, slightly arched, about 1.3 times length of valva; cornuti consisted of a cluster of needlelike



Figures 7–9. *Cathyalia* spp., male genitalia. 7. *C. okinawana*, slide No. RYD04428 (a. Uncus, slide No. RYD04428; b. Uncus, slide No. LHX14086; c. Cornuti, slide No. RYD04428; d. Cornuti, slide No. LHX14086). 8. *C. fulvella*, slide No. LJY10259. 9. *C. pallicostella*, slide No. LJY10244. Scales bar=0.5 mm.

thorns at apex and a slender, sinuate sclerite, which about 4/5 length of aedeagus. Culcita included a bunch of long hairs.

Female genitalia (Fig. 12). Ostium situated at intersegmental membrane between seventh and eighth segments, slightly narrower than antrum. Antrum rectangular, width 1.5 times as long as length, rounded at angles. Ductus bursae moderate in width, anterior 1/5 membranous, posterior 4/5 sclerotized. Corpus bursae elongate, oval, about same length of ductus bursae,



Figures 10–12. *Cathyalia* spp., female genitalia. 10. *C. okinawana*, slide No. LHX14087 (a. Ductus bursae, slide No. LHX14090; b. Signa, slide No. LJY11125; c. Signa, slide No. LHX14090; d. Signa, slide No. RYD04678; e. Signa, slide No. RYD04478). 11. *C. fulvella*, slide No. RYD04634. 12. *C. pallicostella*, slide No. RYD2014244. Scale bar = 0.5 mm.

with a large, oval patch consisting of minute thorns posterolaterally. Signa comprised of more than 10 small nail-like conical spines, located at sclerotized rounded plates, obliquely arranged in posterior 2/5 of corpus bursae.

Material examined. Hainan, 6♂10♀ (NKUM), 2♂4♀ (HAASM); Yunnan, 2♂1♀ (NKUM); Hong Kong, 1♀ (NKUM).
Distribution. China (Hainan, Hong Kong, Yunnan), Indonesia.

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