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Review of the *nigroapicella* group in the genus *Ethmia* Hübner, [1819] from China (Lepidoptera: Elachistidae, Ethmiinae)

J. J. Wang & S. X. Wang

Abstract

The *nigroapicella* group of the genus *Ethmia* Hübner, [1819] is reviewed in China. Six species are included, of which *E. argopa* Meyrick, 1910 and *E. hilarella* (Walker, 1863) are newly recorded for China. The male of *E. argopa* Meyrick, 1910 is described for the first time for science, and the illustration and description of female genitalia of *E. hilarella* (Walker, 1863) is given for the first time; *E. yunnanensis* Liu, 1980 is redescribed; three other known species are noted: *E. dentata* Diakonoff & Sattler, 1966, *E. nigroapicella* (Saalmüller, 1880), and *E. praeclara* Meyrick, 1910. Photographs of adults and genitalia are provided.

KEY WORDS: Lepidoptera, Elachistidae, Ethmiinae, *Ethmia*, new record, China.

Revisión del grupo de *nigroapicella* en el género *Ethmia* Hübner, [1819] de China (Lepidoptera: Elachistidae, Ethmiinae)

Resumen

Se revisa el grupo *nigroapicella* del género *Ethmia* Hübner, [1819] en China. Se incluyen seis especies, de las cuales *E. argopa* Meyrick, 1910 y *E. hilarella* (Walker, 1863) son nuevos registros para China. El macho de *E. argopa* Meyrick, 1910 se describe por primera vez para la ciencia y se da por primera vez la descripción de la genitalia de la hembra de *E. hilarella* (Walker, 1863); se redescribe *E. yunnanensis* Liu, 1980; se indican otra tres conocidas especies: *E. dentata* Diakonoff & Sattler, 1966, *E. nigroapicella* (Saalmüller, 1880) y *E. praeclara* Meyrick, 1910. Se presentan fotografías de los adultos y de las genitalias.

PALABRAS CLAVE: Lepidoptera, Elachistidae, Ethmiinae, *Ethmia*, nuevas citas, China.

Introduction

The *nigroapicella* group is characterized by the following characters: the forewing having 3-5 black apical spots arranged in an arc, the orange-yellow hindwing with a brown apical patch, the thorax with two black spots set near middle and distal respectively, the orange-yellow abdomen with a row of black dots on tergites and paired black dots on each sternite; male genitalia with caudal part of gnathos usually elongate, the rectangular costa mostly longer than 1/2 length of valva, and the handle-shaped cucullus densely covered with long and thick bristles; female genitalia with apophysis anterior extremely short or absent, the eighth sternite depressed to a sack close to both sides of ostium, the antrum with varied radiating dentation on inner wall, and the folded signum with laced margins.

Nine species are known in the *nigroapicella* group. *Ethmia dentata* Diakonoff & Sattler, 1966, *E. nigroapicella* (Saalmüller, 1880), *E. praeclara* Meyrick, 1910 and *E. yunnanensis* Liu, 1980 were recorded previously in China; *E. argopa* Meyrick, 1910 and *E. hilarella* (Walker, 1863) are newly recorded for China in this paper. Of the other three described species, *E. thoraea* Meyrick, 1910 is

endemic to Australia, *E. pullata* Meyrick, 1910 is distributed in the Solomon Islands and *E. submersa* Diakonoff, 1966 is recorded in West Celebes.

Materials examined in this study are deposited in the Insect Collection, Nankai University (NKU), Tianjin; China Agricultural University (CAU), Beijing; the Institute of Zoology, Chinese Academy of Sciences (IZCAS), Beijing; the Natural History Museum, London (BMNH); and the National Museum of Natural History, Smithsonian Institution, Washington D.C., USA (NMNH).

Taxonomic accounts

Ethmia argopa Meyrick, 1910 (Figs. 1, 7, 13)

Ethmia argopa Meyrick, 1910: 461. TL: Malay States.

Description: Adult (Fig. 1) with wingspan 30.0-32.0 mm.

Male genitalia (Fig. 7): Uncus with basal 2/5 roughly trapezoided, distal 3/5 bifurcated; bifurcated part parallel, obliquely extended to lateral side distally, gradually thinned to a pointed tip. Caudal part of gnathos nearly 1/2 as long as uncus, specialized to an elongate triangle, bearing a few apical spines; oral part about 1.5 times width of caudal part, without spines, protruded anteromedially. Labis broad, nearly as long as costa. Costa slightly shorter than cucullus; sacculus densely covered with long bristles, narrowed at base, gradually widened to blunt apex; cucullus knifelike, nearly as long as valva, densely covered with long bristles except at base. Juxta with posterolateral lobes nearly as long as labis, narrowed at base, gradually broadened to middle, then narrowed to pointed tip.

Female genitalia (Fig. 13): As illustrated.

Material examined: CHINA: 2 ♂♂, Mt. Daming (23° 8' N, 108° 4' E), Guangxi Zhuang Autonomous Region, 1250 m, 27-29-V-2011, leg. Linlin Yang and Yinghui Mou, gen. slide no. WJJ10109 (NKU); 1 ♂, 1 ♀, Leidashaosuo, Tongguling (19° 40' N, 111° 1' E), Wenchang City, Hainan Province, 350 m, 20-VII-2008, leg. Bingbing Hu and Li Zhang, gen. slide nos. WJJ10062♂, WJJ10063♀ (NKU); 1 ♂, Tongguling (19° 42' N, 111° 0' E), Wenchang City, Hainan Province, 15.3 m, 19-III-2008, leg. Chunsheng Wu (IZCAS).

Distribution: China (Guangxi, Hainan), Malay States.

Diagnosis: This species can be identified by the forewing having three black apical spots instead of four or five as in its congeners; the male genitalia with caudal part of gnathos specialized to an elongate triangle, and the cucullus sickle-shaped; the female genitalia with a boat-shaped signum.

Notes: This species is newly recorded for China. Its male is described for the first time for science.

Ethmia hilarella (Walker, 1863) (Figs. 2, 8, 14)

Azinis hilarella Walker, 1863: 542. TL: Sri Lanka.

Ethmia duplicata Meyrick, 1914: 130. TL: Sri Lanka.

Ethmia hilarella: Clarke, 1965: 426.

Description: Adult (Fig. 2) with wingspan 32.5 mm.

Male genitalia (Fig. 8): As illustrated.

Female genitalia (Fig. 14): Ovipositor rectangular in shape, with sparse bristles. Apophysis posterior slender, slightly widened distally, two times length of ovipositor; apophysis anterior indistinct, fused with eighth sternite. Ostium bursae rounded; lamella postvaginalis oval, scobinated. Antrum with dense teeth and spines, with a narrow toothed band at base. Ductus bursae long, with several coils. Corpus bursae oval; signum semicircular.

Material examined: CHINA: 1 ♂, Hainan Province (20° 1' N, 110° 20' E), 08-VII-1982, leg. Yuanfu Liu (IZCAS), gen. slide no. WJJ11010; 1 ♀, Hainan Province (20° 1' N, 110° 20' E), 08-VII-1982, leg. Maobin Gu, gen. slide no. WJJ11008 (IZCAS); 1 ♀, Jianfengling (19° 8' N, 109° 35' E), Hainan Province, 12-14-IV-2009, leg. Min Wang *et al.*, gen. slide no. WJJ10090 (NKU); 1 ♀, Jianfengling (19° 8' N, 109° 35' E), Hainan Province, 18-IV-1982, leg. Zhiqing Chen (IZCAS), gen. slide no. WJJ11009; 1 ♀, Jianfengling (18° 43' N, 108° 50' E), 810 m, 30-III-2008, leg. Bingbing Hu and Haiyan Bai, gen. slide no. WJJ10060 (NKU).

Distribution: China (Hainan), India, Sri Lanka.

Diagnosis: This species is similar in appearance to *E. yunnanensis* Liu, 1980, but can be distinguished by the absence of the black dots on the first and the third abdominal tergites and the hindwing with inner margin of the black apical patch protruded toward base; in *E. yunnanensis* the black dots are present on each abdominal segment, and the inner margin of the black apical patch is somewhat serrated. It is also similar to *E. submersa* Diakonoff, 1966 in the male genitalia, but can be easily recognized by the cucullus having a short hammerlike apical process, which is absent in the latter species.

Notes: This species is newly recorded for China. Illustration and description of female genitalia are given for the first time.

Ethmia yunnanensis Liu, 1980 (Figs. 3, 9, 15)

Ethmia yunnanensis Liu, 1980: 277. TL: Yunnan, China.

Redescription: Adult (Fig. 3) with wingspan 37.0-38.0 mm. Head white, neck with a cluster of black scales centrally. Labial palpus with basal segment on dorsal surface, second segment on basal half and subapex and third segment on base and distal half black, remaining parts white. Antenna with scape white, posterior margin black at base and apex; flagellum grayish brown except white on dorsal 1/4. Collar pale gray, with lateral black dot. Thorax pale gray, with paired black spots medially and posteriorly. Tegula pale gray, with black spot near base on inner margin.

Forewing gray, costal margin yellowish gray except black on basal 1/5; eighteen black spots present: one at base of wing, one near base and one at basal 1/5 below costal margin; one at basal 1/4 between fold and dorsum, and one at 1/2 near dorsum; cell with one on upper margin beyond middle and one above upper corner; fold with one at base, at basal 1/3, 2/3 and 3/4 respectively; seven apical spots arranged nearly in a ring; eleven marginal dots extending from before apex along termen to tornus; cilia gray basally, deep gray distally. Hindwing and cilia orange-yellow; triangular grayish brown apical patch covering nearly 1/4 of hindwing, its inner edge dentate. Legs grayish white, tarsus black on ventral surface, black on dorsal surface; femur and tibia of fore leg with black spot on ventral surface, tibia of mid leg overlaid with four black spots on outer surface, tibia of hind leg orange-yellow. Abdomen orange-yellow, tergites with a small rounded dot on each segment, sternites with paired rounded spots on each segment.

Male genitalia (Fig. 9): Uncus with basal 2/3 nearly squared in shape, distal 1/3 V-shaped, narrowed gradually to a blunt apex. Gnathos slightly longer than uncus; caudal part nearly fan-shaped, with teeth posteriorly; oral part slightly concave inward at middle on anterior margin, covered with dense short spines. Labis slender, covered with long bristles, 2/3 length of gnathos. Sacculus elongate oval, with long thick bristles, bearing a small finger-shaped dorsoapical process; cucullus nearly 1/2 length of valva, narrowed basally, dilated distally. Juxta with sicklelike lateral lobes equal to length of labis, narrowly rounded at apex.

Female genitalia (Fig. 15): Ovipositor nearly collar-shaped, sparsely covered with long bristles. Apophysis posterior slender, somewhat widened distally; apophysis anterior extremely short, slightly wider and flat basally, gradually narrowed to a hooked tip bending inward. Eighth sternite close to ostium bursae depressed in foot shape anteriorly, with dense fine spines. Ostium bursae oval. Antrum with small dense teeth on inner surface near base and a row of small teeth at base. Ductus bursae long, tubular. Corpus bursae elongate oval; signum an elongate narrow plate, with a longitudinal heavily sclerotized median ridge.

Material examined: CHINA: Holotype ♂, Jinghong (21° 59' N, 100° 47' E), Xishuangbanna, Yunnan Province, 650 m, 22-VI-1958, leg. Xuwu Meng (IZCAS). Allotype ♀, Menglun Town (21° 56' N, 101° 15' E), Yiwubanna, Yunnan Province, 650 m, 28-IV-1964, leg. Baolin Zhang, gen. slide no. 74-057 (IZCAS).

Additional material: CHINA: 1 ♂, Tianchi, Jianfengling (18° 43' N, 108° 50' E), Hainan Province, 810 m, 30-III-2008, leg. Bingbing Hu and Haiyan Bai, gen. slide no. WJJ10061 (NKU); 1 ♀, Jianfengling (19° 8' N, 109° 35' E), Hainan Province, 12-14-IV-2009, leg. Min Wang *et al.*, gen. slide no. WJJ10101 (NKU); 1 ♂, 1 ♀, Mengshui (31° 16' N, 121° 24' E), Hainan Province, 13-14-III-1984, gen. slide nos. WJJ11006♂, WJJ11007♀ (IZCAS).

Distribution: China (Hainan, Yunnan).

Diagnosis: This species is closely allied to *E. hilarella* (Walker, 1863) externally, but differs in the abdomen having dorsal spots on each segment, which are absent on the first and third segments in *E. hilarella*; the brown apical patch in the hindwing is dentate and nearly straight on the inner margin, which is smooth and convex in the latter species.

Ethmia dentata Diakonoff & Sattler, 1966 (Figs. 4, 10, 16)

Ethmia dentata Diakonoff & Sattler, 1966: 189. TL: Taiwan, China.

Ethmia duplicata Moriuti (*nec* Meyrick), 1963: 36.

Description: Adult (Fig. 4) with wingspan 26.0 mm.

Male genitalia (Fig. 10): As illustrated.

Female genitalia (Fig. 16): As illustrated.

Material examined: CHINA: Holotype ♂, Takow, Formosa [Taiwan], 17-X-1905, leg. A. E. Wileman, gen. slide no. 7482 (NHM); paratype: 1 ♂, 1 ♀, Takow (23° 0' N, 120° 39' E), Taiwan, 30-VIII-1904, leg. A. E. Wileman, gen. slide nos. WJJ10139♂, WJJ10140♀ (NMNH).

Distribution: China (Taiwan), Japan, Philippine.

Host Plant: *Ehretia* sp. (Boraginaceae).

Diagnosis: The species can be easily distinguished from its congeners by the forewing having five black apical spots and the sixth and seventh tergites with narrow median black band on the anterior margin.

Ethmia nigroapicella (Saalmüller, 1880) (Figs. 5, 11, 17)

Psecadia nigroapicella Saalmüller, 1880: 310. TL: Madagascar.

Ethmia colonella Walsingham, 1907: 507. TL: Hawaii.

Ethmia meteoris Meyrick, 1911: 289. TL: Seychelles.

Ethmia systematica Meyrick, 1922: 552. TL: Myanmar.

Psecadia apicalis Matsumura, 1931: 1084. TL: Japan.

Ethmia apicalis: Moriuti, 1963: 35.

Ethmia nigroapicella: Sattler, 1967: 127.

Description: Adult (Fig. 5) with wingspan 25.5-28.5 mm.

Male genitalia (Fig. 11): As illustrated.

Female genitalia (Fig. 17): As illustrated.

Material examined: CHINA: 1 ♂, 1 ♀, South China Botanical Garden (23° 11' N, 113° 21' E), Guangzhou City, Guangdong Province, 1967, gen. slide no. WJJ11016♀ (CAU); 1 ♂, 3 ♀♀, Yan Mountain (25° 14' N, 110° 16' E), Guilin, Guangxi Zhuang Autonomous Region, 07-VIII-1985, leg. Tianshan Li, gen. slide nos. WJJ11004♀, WJJ11005♀ (IZCAS); 1 ♂, 1 ♀, Yan Mountain (25° 14' N, 110° 16' E), Guilin, Guangxi Zhuang Autonomous Region, 14-VIII-1985, leg. Tianshan Li (IZCAS); 5 ♂♂, Datian National Natural Reserve (19° 6' N, 108° 47' E), Hainan Province, 100 m, 27-28-IV-2009, leg. Bingbing Hu and Qing Jin, gen. slide nos. WJJ10064♂, WJJ10072♂ (NKU).

Distribution: China (Guangdong, Guangxi, Hainan, Taiwan), Japan, Ryukyu, India, Philippine, Burma, Madagascar, Seychelles, Australia, New Guinea Islands, Solomon Islands, Samoa, Fiji, Gilbert Islands, Hawaii.

Host Plants: *Cordia subcordata* (Boraginaceae), *Ehretia buxifolia*, *E. dicksonii* var. *japonica*, *E. laevis*, *E. resinosa* (Boraginaceae).

Diagnosis: This species is marked by the forewing having six black apical spots and the abdomen having dorsal spot on each segment, and the male genitalia with caudal part of gnathos somewhat cristate.

Ethmia praeclara Meyrick, 1910 (Figs. 6, 12)

Psecadia hilarella Turner, 1898 (not Walker, 1863): 213. TL: Australia.

Ethmia praeclara Meyrick, 1910: 460.

Description: Adult (Fig. 6) with wingspan 33.5 mm.

Male genitalia (Fig. 12): As illustrated.

Material examined: CHINA: 1 ♂, Orchid Isl. (22° 2' N, 121° 32' E), 4 km SW Hung'ou narrow valley, Taiwan, 5-10 m, 16-20-VII-1980, leg. D. R. Davis, gen. no. WJJ10141 (NMNH).

Distribution: China (Taiwan), Malaysia, Philippines, India, Indonesia, New Guinea, Australia.

Diagnosis: This species differs from its congeners in the forewing having three black dots above tornus instead of having one or two, and the male genitalia with a triangular sacculus.

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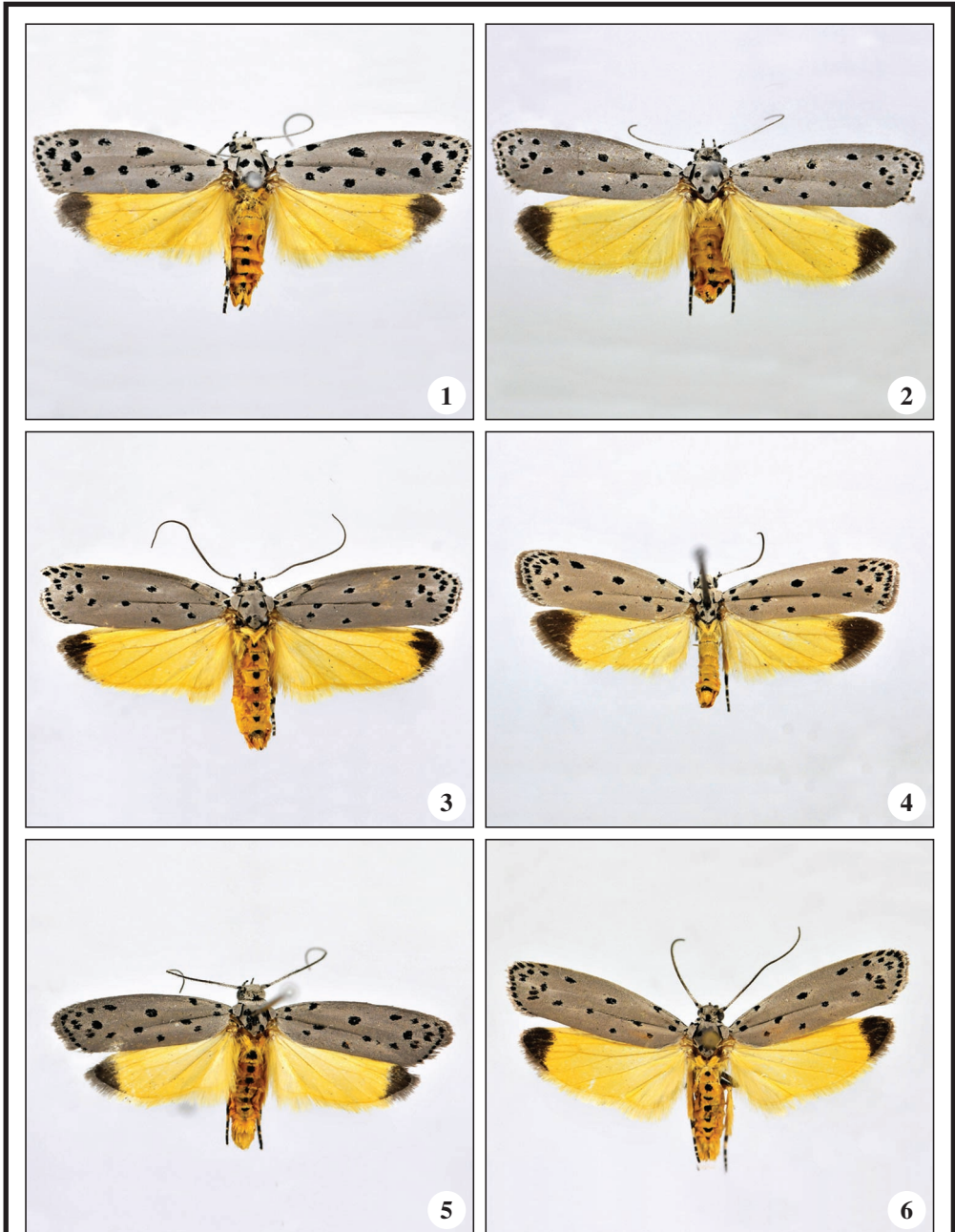
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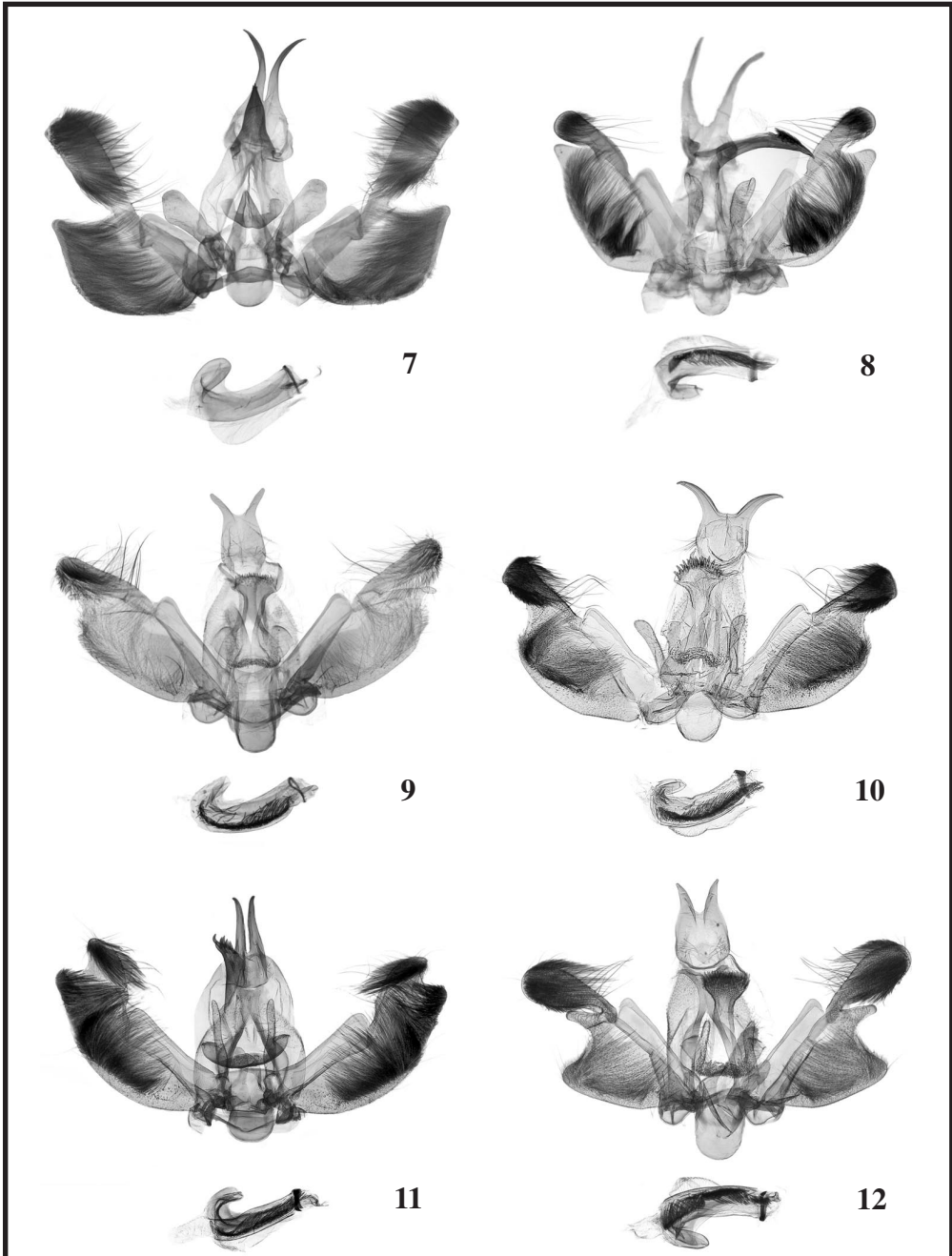
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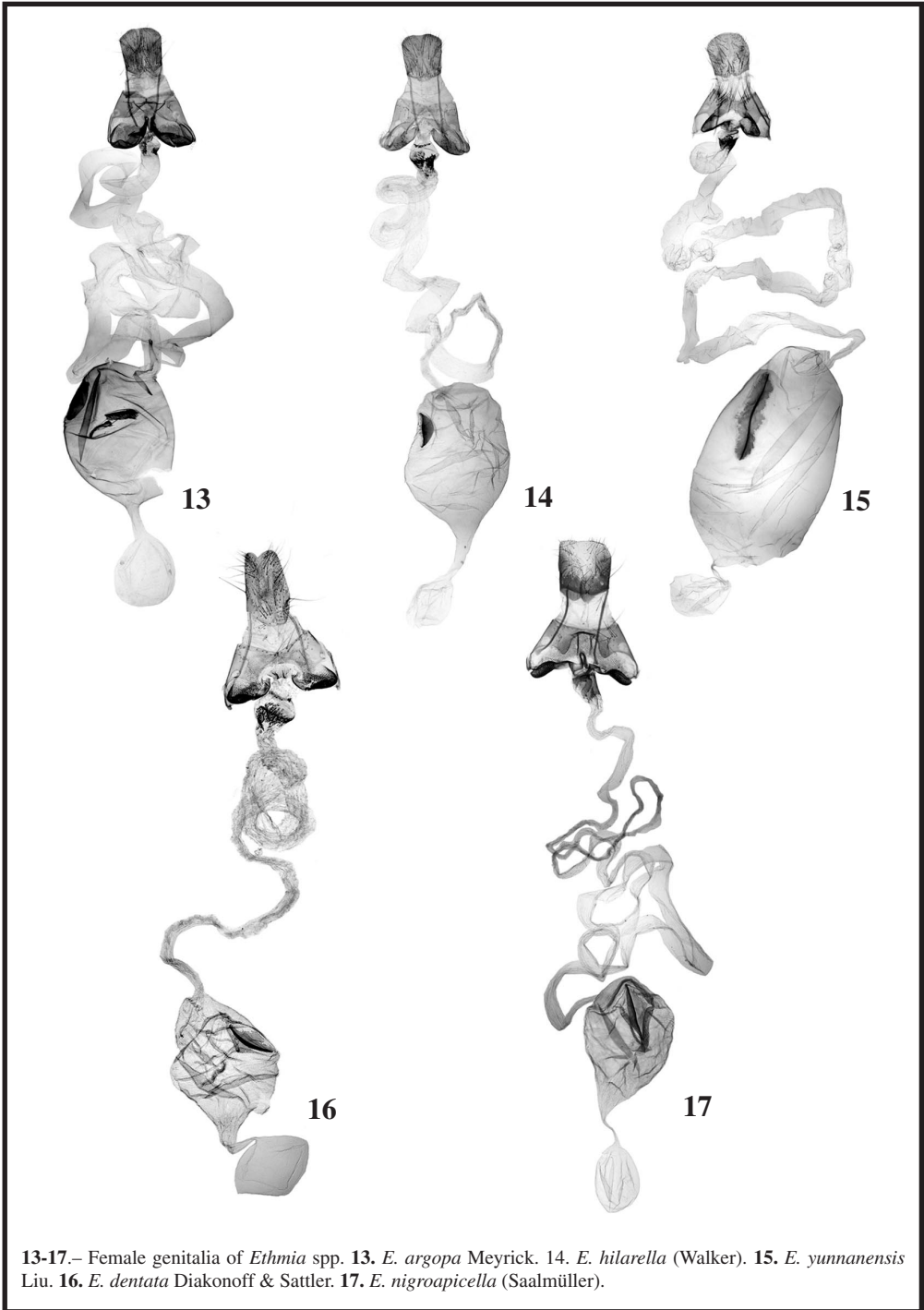
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Figs. 1-6.— Adults of *Ethmia* spp. 1. *E. argopa* Meyrick. 2. *E. hilarella* (Walker). 3. *E. yunnanensis* Liu. 4. *E. dentata* Diakonoff & Sattler. 5. *E. nigroapicella* (Saalmüller). 6. *E. praeclara* Meyrick.



Figs. 7-12.— Male genitalia of *Ethmia* spp. **7.** *E. argopa* Meyrick. **8.** *E. hilarella* (Walker). **9.** *E. yunnanensis* Liu. **10.** *E. dentata* Diakonoff & Sattler. **11.** *E. nigroapicella* (Saalmüller). **12.** *E. praeclara* Meyrick.



13-17.— Female genitalia of *Ethmia* spp. 13. *E. argopa* Meyrick. 14. *E. hilarella* (Walker). 15. *E. yunnanensis* Liu. 16. *E. dentata* Diakonoff & Sattler. 17. *E. nigroapicella* (Saalmüller).