

## New and little-known Ethmiidae (Gelechioidea) from Central Asia

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**Abstract.** Three new species of Ethmiidae are described from Central Asia: *Ethmia falkovitshi* sp. n. (type locality: Western Kazakhstan, Mangistau Region, N 43°44'04" E 53°37'17", in coll. ZISP), *E. nykta* sp. n. (type locality: Southwest China, Sichuan, Chang Jiang river basin, environs Bana-Dzhun, in coll. ZISP), and *E. albolinella* sp. n. (type locality: Southwest China, Sichuan, Chang Jiang river basin, environs Bana-Dzhun, in coll. ZISP). Images of the adults and genitalia structures of type specimens of the little-known *E. vidua flavilaterella* Danilevsky, 1975, *E. soljanikovi* Danilevsky & Zaguljaev, 1975, *E. sibirica* Danilevsky, 1975, *E. ubsensis* Zaguljaev, 1975, *E. elimatella* Danilevsky, 1975, *Dasyethmia hiemalis* Danilevsky, 1969, and *E. zaguljaevi* Kostjuk, 1980 are given. The previously unknown females of *E. elimatella* Danilevsky, 1975 and *E. turkmeniella* Dubatolov & Ustjuzhanin, 1998 are described. The species *E. turkmeniella* Dubatolov & Ustjuzhanin, 1998, originally described from Turkmenistan, is found in Kalmyk Republic and is therefore new for Russia and Europe.

**Резюме.** Из Средней Азии описаны три новых вида этмий: *Ethmia falkovitshi* sp. n. (типовая местность: Western Kazakhstan, Mangistau Region, N 43°44'04" E 53°37'17" в колл. ЗИН РАН), *E. nykta* sp. n. (типовая местность: Southwest China, Sichuan, Chang Jiang river basin, environs Bana-Dzhun, в колл. ЗИН РАН), и *E. albolinella* sp. n. (типовая местность: Southwest China, Sichuan, Chang Jiang river basin, environs Bana-Dzhun, в колл. ЗИН РАН). Для малоизвестных: *E. vidua flavilaterella* Danilevsky, 1975; *E. soljanikovi* Danilevsky & Zaguljaev, 1975; *E. sibirica* Danilevsky, 1975; *E. ubsensis* Zaguljaev, 1975; *E. elimatella* Danilevsky, 1975; *Dasyethmia hiemalis* Danilevsky, 1969; and *E. zaguljaevi* Kostjuk, 1980 приведены изображения типовых экземпляров и структур гениталий самцов. Описаны ранее неизвестные самки для *E. elimatella* Danilevsky 1975, and *E. turkmeniella* Dubatolov & Ustjuzhanin 1998. Известная ранее только из Туркмении *E. turkmeniella* Dubatolov & Ustjuzhanin, 1998 найдена в республике Калмыкия и является новой для России и Европы.

### Introduction

In May 2007, on the Southern Ustyurt (Western Kazakhstan) I collected an unknown *Ethmia* species (Fig. 1). The species belongs to the *distigmatella* group and is new to science. A long series of the same moth from Uzbekistan, collected mainly by M. I. Falkovitch, was assembled during work with the collection of the Zoological Institute of the Russian Academy of Sciences (ZISP) (St. Petersburg, Russia). An examination of ethmiids of Central Asia in ZISP revealed two more unknown species. One of them belongs to the *pyrausta* species group (Fig. 2), another to the *nigripedella* species group (Fig. 3). These moths were collected by P. K. Kozlov in China (Sichuan Province of Southwest China, Chang Jiang river basin) in 1901 during an expedition of the Imperial Russian Geographical Society.

Many Ethmiidae kept in the collection of ZISP are still little known. They were described in Russian after the publication of Sattler's outstanding work (Sattler 1967) but access to literature and specimens remains difficult for non-Russian scientists. Eight new taxa from the Asian part of Russia and neighboring territories were described in the following thirty years after Sattler's monograph. In 1969, the remarkable



winter-flying *Dasyethmia hiemalis* was described by Danilevsky from the deserts of Kazakhstan. In 1975, he described two more new taxa: *Ethmia elimatella* Danilevsky from Ordubad, Azerbaijan, and *Ethmia vidua flavilaterella* Danilevsky – the central Siberia. Three more species were described in 1975 by Zaguljaev and Danilevsky from Mongolia: *E. soljanikovi* Danilevsky & Zaguljaev, *E. sibirica* Danilevsky, 1975 and *E. ubsensis* Zaguljaev, 1975. In 1980, Kuznetsov edited the paper “A key to Ethmiidae of the European part of USSR” by the late Danilevsky where he systematized all known data on the Ethmiidae. The same year, Kostjuk described *E. zaguljaevi* from the Altai Republic. In 1997, *E. sibirica*, *E. ubsensis*, *E. soljanikovi*, *E. vidua flavilaterella* were mentioned by Sinev in a work devoted to the Ethmiidae of the Far East of Russia. The same year Dubatolov, Ustjuzhanin & Zintshenko (1997) published a review of the Ethmiidae from the Asian part of Russia and neighboring territories, omitting *Ethmia elimatella* and *Dasyethmia hiemalis*, but a distribution of *E. sibirica* was provided with new data. In 1998, Dubatolov & Ustjuzhanin described *Ethmia turkmeniella* from the SW Kopet-Dagh Mts (Turkmenistan). In 2007, Wei, Kun & Yen wrote that all of the taxa listed above were considered as separate species, but had not been assigned to any of the species groups proposed by previous authors. Also in 2007, *E. elimatella* was mentioned by Kun in his “Studies on Palaearctic *Ethmia* Hb.”

There remain some little-known ethmiids from Central Asia (mainly described from China). Unfortunately I did not have the opportunity to investigate these additional species, and so this manuscript only includes the Ethmiidae described in the Russian literature or kept in the collections of Russian museums.

None of these taxa described in the Russian literature have ever been illustrated in colour. Besides, practically all original descriptions are in Russian and therefore difficult to access. The situation becomes more complicated because these descriptions were often based on single specimens and additional material was absent from the museums visited. The aim of this paper is to provide information on the systematics and distribution of these taxa. Re-descriptions of these rare species are given, and illustrated by images of type specimens, based on the examination of type material and additional data on distribution found by myself or cited in local papers.

### Abbreviations

LSSU	Laboratory of Animal Systematics and Faunistics, Samara State University (Samara, Russia)
CDSS	Collection of Dmitry Shovkoon, Samara
LNK	Landessammlung für Naturkunde, Karlsruhe (Germany)
SZMN	Siberian Zoological Museum, Institute of Animal Systematic and Ecology, Siberian Division of Russian Academy of Sciences (Novosibirsk, Russia)
ZISP	Zoological Institute of Russian Academy of Sciences (St. Petersburg, Russia)
ZMKU	Kiev University Zoological Museum (Ukraine)

### *Ethmia turkmeniella* Dubatolov & Ustjuzhanin, 1998

(Figs 8, 15)

*Ethmia turkmeniella* Dubatolov & Ustjuzhanin, 1998, *Nota Lepidopterologica* 21(2): 101, Figs 1, 2. Type locality: “SW Turkmenistan, SW Kopet-Dag Mts., Kara-Kala”. Holotype: male (SZMN) [not examined].

References: Dubatolov & Ustjuzhanin (1998: 101) (*Ethmia*).



**Material.** 21♂, 2♀, **Turkmenistan**, Repetek southeastern Kara-Kum, 08.v.1981 leg. Falkovitsh (ZISP); 1♂ Turkmenistan, Repetek southeastern Kara-Kum, 06.vi.1981 leg. Falkovitsh (ZISP); 2♂, Turkmenistan, Repetek, 19.v.1981 leg. Krivohatskiy (ZISP); 3♂, Turkmenistan, Amudarja river, Kerki, 18.v.1934, leg. Lupova (ZISP); 1♀, **Uzbekistan**, Kyzyl-Kum desert, tract Zhamansay, 26.v.1975, leg. Falkovitsh (ZISP); 5♂, Uzbekistan, 40 km westward from Bukhara, 15.v.1966, leg. Pastuchov (ZISP); 1♂, Uzbekistan, Kyzyl-Kum desert, tract Zhamansay, 26.v.1975, leg. Falkovitsh (ZISP); 1♂, Uzbekistan, Kyzyl-Kum desert, tract Zhamansay, 30.v.1972 – larva on *Heliotropium* sp., 15.vi.1972 – pupa, 27.vi.1972 – imago, leg. Falkovitsh (ZISP); 1♂, Uzbekistan, Kyzyl-Kum desert, tract Zhamansay, leg. Falkovitsh, 30.v.1972 – larva on *Heliotropium* sp., 14.vi.1972 – pupa, 26.vi.1972 – imago (ZISP); 2♂, Uzbekistan, Bokharan region Shafrikan, 04.ix.1971, leg. Falkovitsh; 1♀, Left coast of the Volga river, by Chagan-Aman, Justinsky area, Kalmykia, **Russia** 31.vii.2007. leg. O. Saranova (LSSU).

**Note.** *Ethmia turkmeniella* Dubatolov et Ustjuzhanin, 1998 was described from SW Turkmenistan, Kopet-Dag Mts, and SE Turkmenistan, Kuhitang Mts. It belongs to the *distigmatella* species group and is easily separated from the closely related species, *E. quadrinotella* (Mann, 1861). The species was described from seven male specimens deposited now in the collection of SZMN. The female of the species is so far unknown, and the moth was occasionally found in LSSU from Kalmyk Republic and identified from the characteristic set of spots on the forewing. The species is therefore recorded for the first time as part of the fauna of Europe and also of Russia. The occurrence of *E. turkmeniella* in the Lower Volga Region expands its distribution more than 800 km to the north. This very interesting finding from the Kalmyk Republic needs additional male material because it is possible that another [new] species, closely related to *E. turkmeniella*, is native to the region.

**Female description** (Fig. 15). Wingspan 16–18 mm (Moth from Kalmyk Republic, 17 mm). Head, thorax, tegulae and antennae covered with whitish scales; head bearing well developed frontal crest with sharp outer edge. Palpi white, long, first segment with dense brush of scales. Legs whitish-grey. Forewings whitish-grey, to some extent darker than hindwings; four contrasting grey spots arranged into two lengthwise rows and 6 or 7 black dots along outer margin; fringes of same colour as wing ground colour. Hindwing evenly white, slightly transparent, without spots.

**Female genitalia** (Fig. 8). Ovipositor conical, papillae anales rounded, setose. Posterior apophyses slender, slightly longer than papillae; apophyses anteriores very reduced. Ductus bursae very long, spiral, with 5 complete turns. Corpus bursae pyriform, rather large, with signum and loose-lying mass disc form, found in three of five females investigated. Signum covered with more or less uniform teeth, asymmetric, with big tooth in middle (Fig. 8c, d).

**Diagnosis.** The species belongs to the *distigmatella* species group. The moth differs from the similar *E. quadrinotella* (Mann, 1861) by the smaller size and more grey colouring of forewings, and in the different shape and structure of the gnathos of the male genitalia.

**Distribution and life history.** The moths inhabit desert and semi desert regions of the Uzbekistan, Kyzyl-Kum desert, Ayakgumdy, Turkmenistan southeastern Kara-Kum (ZISP), and Russia, Kalmykia, in the Lower Volga Region. According to label data (Falkovitsh) *Heliotropium* sp. (Boraginaceae) is the host-plant of the caterpillars. The moths were collected flying from May to June (first generation) and September (second generation).



***Ethmia falkovitshi* sp. n.****(Figs 1, 4, 7)**

**Material.** Holotype ♂, '17.05.2007 **Kazakhstan**, Mangistau Region, N 43°44'04" E 53°37'17" leg. Trofimova T.A. & Shovkoon D.F.' <white rectangle, printed in black ink>, 'HOLOTYPUS. ♂ *Ethmia deserticola* | Shovkoon | design. Shovkoon D. F. 2010' <red rectangle, printed in black ink> (ZISP). – Paratypes: 3♂, 3♀ same data as holotype (1♂, 1♀ in ZISP, 2♂ 1♀ in coll. WCA); 4♂, 16.05.2007 **Kazakhstan**, Mangistau Region, N 43°44'53" E 53°38'13", leg. Trofimova T.A. & Shovkoon D.F. (in coll. WCA); 2♂, 15.05.2007 Kazakhstan, Mangistau Region, N 43°57'39,9" E 53°45'48,0", leg. Trofimova T.A. & Shovkoon D.F. (in coll. WCA); 2♂, 18.05.2007 Kazakhstan, Mangistau Region, N 44°02'51,1" E 52°34'21,6", leg. Trofimova T.A. & Shovkoon D.F. (in coll. WCA); 1♂, 19.05.2007 Kazakhstan, Mangistau Region, N 44°04'55,3" E 52°23'15,6", leg. Trofimova T.A. & Shovkoon D.F. (in coll. WCA); 1♀, 70 км S Тамды-Булака пуст. Кызылкум Узб. Пастухов 1.v.965 [01.05.1965 **Uzbekistan**, Kyzyl-Kum desert, 70 km S Tamdi-Bylak, leg. Pastuhov] (ZISP); 1♀, Аякгужумды 40 км О Джинг. Кызылкум Узб. Фалькович 28.iv.65 [28.04.1965 **Uzbekistan**, Kyzyl-Kum desert, Ayakgumdy, leg. Falkovitsh] (ZISP); 1♂, Аякгужумды 40 км О Джинг. Кызылкум Узб. Фалькович 29.iv.65 [29.04.1965 **Uzbekistan**, Kyzyl-Kum desert, Ayakgumdy, leg. Falkovitsh] (ZISP); 1♀, Аякгужумды 40 км О Джинг. Кызылкум Узб. Фалькович 28.iv.65 [28.04.1965 **Uzbekistan**, Kyzyl-Kum desert, Ayakgumdy, leg. Falkovitsh] (ZISP); 1♀, Аякгужумды 40 км О Джинг. Кызылкум Узб. Фалькович 14.iv.66 [14.04.1966 **Uzbekistan**, Kyzyl-Kum desert, Ayakgumdy, leg. Falkovitsh] (ZISP); 1♂, 1♀, 7 км N Тамды-Булака пуст. Кызылкум Узб. Фалькович 5.v.965 [05.05.1965 **Uzbekistan**, Kyzyl-Kum desert, 70 km S Tamdi-Bylak, leg. Falkovitsh] (ZISP); 1♂, уроч. Жамансай Кызылкум Узбек. Фалькович 12.v.966 [12.05.1966 **Uzbekistan**, Kyzyl-Kum desert, tract Zhamansay, leg. Falkovitsh] (ZISP); 1♂ Жамансай 140 км NW Шаффрикана Узбек. Фалькович 10.v.969 [10.05.1969 **Uzbekistan**, Kyzyl-Kum desert, tract Zhamansay, leg. Falkovitsh] (ZISP); 1♂, уроч. Жамансай Кызылкум Узбек. Фалькович 26.v.975 [26.05.1975 **Uzbekistan**, Kyzyl-Kum desert, tract Zhamansay, leg. Falkovitsh] (ZISP); 1♂, 1♀, уроч. Жамансай Кызылкум Узбек. Фалькович 24.iv.976 [24.04.1976 **Uzbekistan**, Kyzyl-Kum desert, tract Zhamansay, leg. Falkovitsh] (ZISP); 1♀, уроч. Жамансай Кызылкум Узбек. Фалькович 29.iv.976 [29.04.1976 **Uzbekistan**, Kyzyl-Kum desert, tract Zhamansay, leg. Falkovitsh] (ZISP).

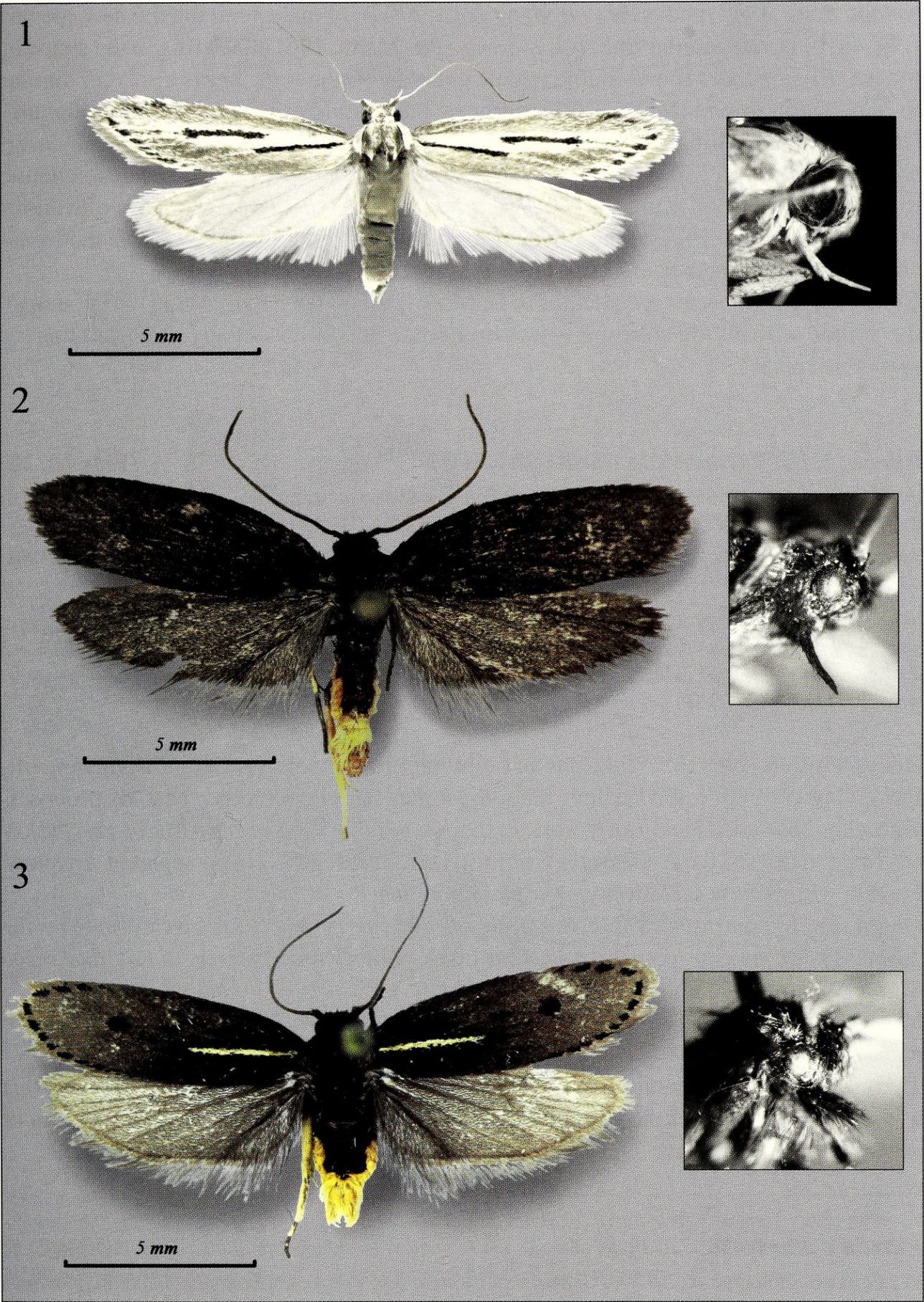
**Description** (Fig. 1). Wingspan 13–16 mm, in holotype 15 mm. Antenna filiform, white; flagellum white; maxillary palpus reduced. Labial palpus with white scales; base of proboscis with white scales; frons and tegulae similarly white. Costal half of forewing suffused with grey scales; basal half with two little lines, black marginal dots present, tiny; cilia pale grey. Hindwing pale grey, with white cilia; costal brushes absent. Legs pale grey. Abdomen and thorax with grayish scales. Wing venation (Fig. 4c) with forewing Sc vein set in middle costal border of wing; R<sub>4</sub> and R<sub>5</sub> on long stalk (1/2 general length of veins); R<sub>4</sub>+R<sub>5</sub> connate or slightly stalked with M<sub>2</sub>; M<sub>2</sub> slightly stalked with M<sub>3</sub>. Hindwing: M<sub>3</sub> slightly stalked with Cu<sub>1</sub>.

**Male genitalia** (Fig. 4a, b). Uncus developed, hood-like, apically bifurcated. Anellus sclerotized, with two dentate processes. Labis short, bristly. Valva elongate. Cucullus with thin appendix, covered scattered bristles.

**Female genitalia** (Fig. 7). Ovipositor conical, papillae anales rounded, setose. Posterior apophyses slender, as long as papillae; apophyses anteriores absent. Ductus bursae very long, spiral, with 6 complete turns. Corpus bursae rather large, oval. Signum large, covered with more or less uniform teeth, asymmetric, with big tooth in middle and two marginal teeth (Fig. 7c, d).

**Diagnosis.** Two prominent black streaks in the forewing pattern of *E. falkovitshi* sp. n. easily distinguishes it from other moths of the *distigmatella* species group (*quadrinotella* Mann, 1861; *quadrinotella atticella* Caradja, 1920; *galaxaea* Meyrick, 1922; *quinenotella* Chrétien, 1915; *quadrinotella heratella* Amsel, 1969; *quadrinotella huai-*





**Figs 1–3.** Adults of *Ethmia* spp. **1.** *Ethmia falkovitshi* sp.n., male, holotype. **2.** *Ethmia nykta*, sp.n., male, holotype. **3.** *Ethmia albolinella*, sp.n., male, holotype.



*rouana* Yang, 1977, and *cribravia* Wang & Li, 2004). In male genitalia the new species (Fig. 4a, b) is very similar to *E. q. quadrinotella* (Mann, 1861), differing in the shape of the valva being more round. In the female genitalia the new species is also very similar to *E. q. quadrinotella* (Mann, 1861), differing in the more echinated and rough signum.

**Distribution and life history.** From our data, the moths inhabit desert and semi desert regions of Western Kazakhstan at an altitude of 150 m. Besides, the species is native to Uzbekistan, Kyzyl-Kum desert, Ayakgujumdy, where it is known from elevations of 150–300 m (ZISP). The biology and immature stages are unknown. The moths are common night-fliers from mid April to late May.

**Etymology.** The species is dedicated to Dr Mark Isaakovitsh Falkovitsh (St. Petersburg), the author of many outstanding works on Lepidoptera who initially collected this remarkable species.

### *Ethmia vidua flavilaterella* Danilevsky, 1975

(Figs 10, 20)

*Ethmia vidua flavilaterella* Danilevsky, 1975: Entomogicheskoe obozrenie **54**(3): 616. Fig. 3. Type locality: "Central'naya Sibir", Wilui" [Russia, Central Siberia, Wilui]. Holotype: male (ZISP) [examined].

References: Danilevsky (1975: 616); Danilevsky (1976: 32); Danilevsky (1980: 343); Zagulajev (1981: 644) (*Ethmia*).

**Material.** Holotype ♂ with labels: '♂ | Wilui', on the back '20 VII 89, | O. Herz' <white rectangle, in black ink>, 'кол. б. Вел. Кн. | Николая | Михайловича' [collection of Grand Duke Nikolay Mikhailovich] <white rectangle, printed in black ink>, 'Holotypus. | *Ethmia vidua* | *flavilaterella* Danil.' <red rectangle, written in black ink> (ZISP). – Paratype: 1 ♀ with same data (ZISP).

**Redescription** (Fig. 10). Wingspan of holotype 21 mm, paratype 20 mm. Antenna filiform, clay-colored. Labial palpus smooth, somewhat clay-colored; base of proboscis with clay-colored scales; frons, vertex, thorax, tegulae, and legs similarly clay-colored. Male abdomen dark, ventrally from segment 7 and lateral from segment 4 yellow. Female with yellow scales only on top of abdomen.

**Diagnosis.** In contrast *E. vidua vidua* (Staudinger, 1879) lacks the black points on the thorax. Forewing clay-colored, with four black points located just as in *E. vidua vidua* Stgr, black marginal dots absent.

**Male genitalia** (Fig. 20). From *E. vidua vidua* (Fig. 21) differs in a shape of cucullus.

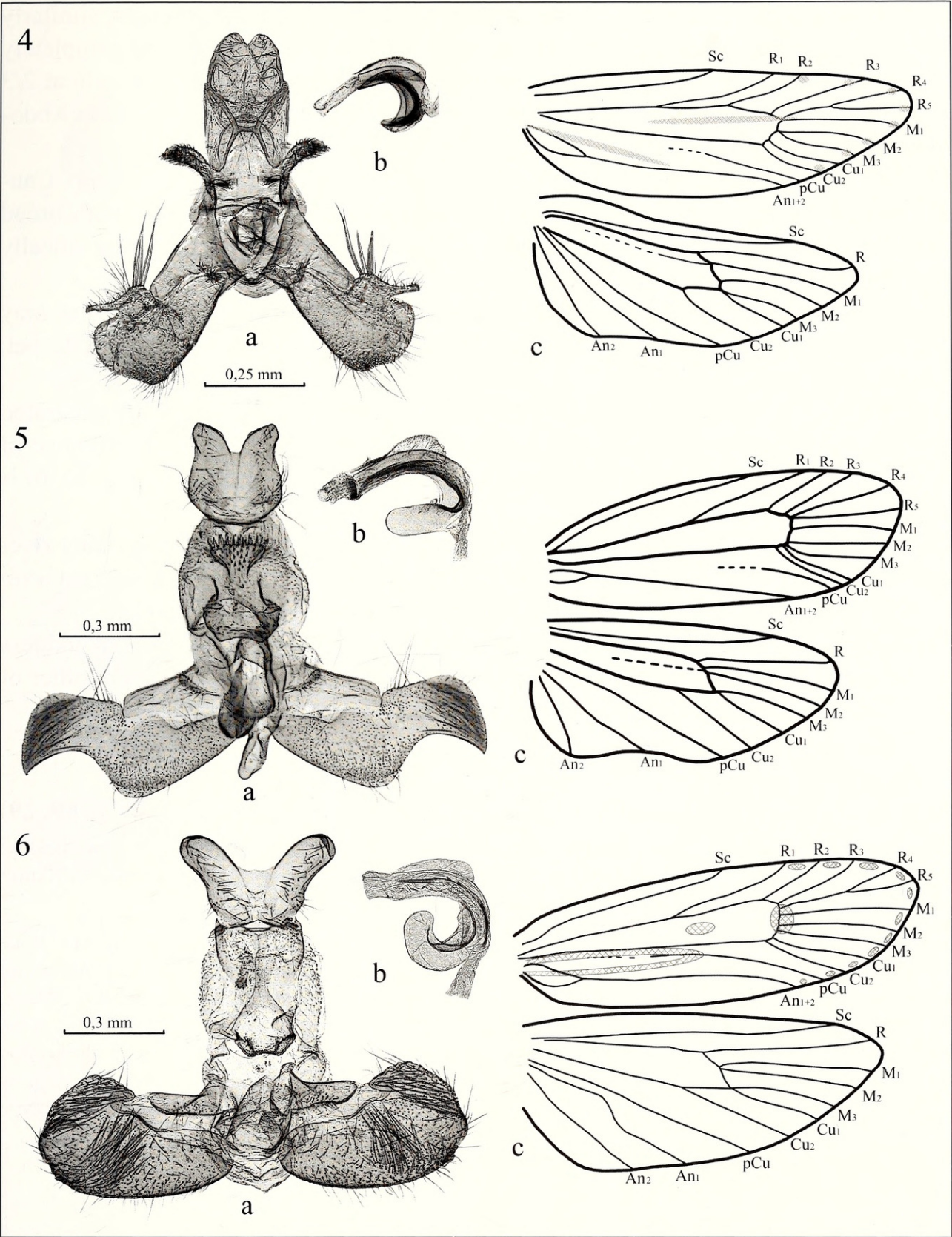
**Taxonomic notes.** This subspecies is known from the type series only. It is thought that it is a good species, but the lack of additional material does not allow confirmation of this status with certainty.

### *Ethmia nykta* sp. n.

(Figs 2, 5)

**Material.** Holotype ♂, 'ок. ур. Бана-Джун | Камъ, бас. Голубой | Козловъ. 1/2 iv 01 [environs Bana-Dzhun, Kam, valley of Goluboy River, leg. Kozlov. 1/2. iv.1901]' <white rectangle, printed in black ink>, 'HOLOTYPUS. | ♂ *Ethmia nykta* | Shovkoon | design. Shovkoon D. F. 2010' <red rectangle, printed in black ink> (ZISP). – Paratype: 1 ♂, р. Дза-чю, Камъ басс. Голубой Козловъ. 26 iv 01 [Dza-chju River, Kam, valley of Goluboy River, leg. Kozlov. 26. iv.1901] (ZISP).





**Figs 4–6.** Male genitalia and venation of *Ethmia* spp. **4.** *Ethmia falkovitshi* sp.n.: **a** and **b.** male genitalia, holotype; **c.** wing venation. **5.** *Ethmia nykta*, sp.n.: **a** and **b.** male genitalia, holotype; **c.** wing venation. **6.** *Ethmia albolinella*, sp.n.: **a** and **b.** male genitalia, holotype; **c.** wing venation.

**Description** (Fig. 2). Wingspan: holotype 18 mm, paratype 17 mm. Antenna filiform, black; flagellum black; maxillary palpus reduced. Labial palpus with black scales; base



of proboscis with black scales; frons, vertex, thorax, tegulae, and forelegs, similarly black. Midlegs and hindlegs: femur black, tarsus with yellow scales. Wings completely black, without any patterning. Wing venation (Fig. 5c) with forewing: Sc vein at 2/3 along costa;  $M_3$  slightly stalked with  $Cu_1$ . Hindwing:  $M_3$  and  $Cu_1$  on short stalk. Abdomen: segments 3–5 laterally yellow, segments 6–8 with yellow scales.

**Male genitalia** (Fig. 5a,b). Uncus developed, hood-like, bifurcated to top. Caudal part of gnathos armed with thorns, anterior part roughly sclerotized, with broad base. Labis short, bristly. Valva long, pointed. Cucullus broad at base, tapering apically into pointed apex. Phallus gun-shaped, without cornuti.

Female unknown. It can be expected that the female of this early vernal species may be brachypterous, by analogy with the brachypterous female of *E. discrepitella* (Rebel, 1901) (Shovkoon 2008).

**Diagnosis.** This species belongs to the *pyrausta* species group. It is easily separated from *E. pyrausta* (Pallas, 1771) and *E. discrepitella* (Rebel, 1901) by the absence of black spots on the forewings. The shape of the valva of the new species (Fig. 5a, b) is highly diagnostic.

**Distribution and life history.** The moths were collected from the Chang Jiang river basin, Sichuan Province (SW China): N 31°59'55", E 99°22'02", altitude above sea level – 3650 m (Kozlov, 1906). The biology and immature stages are unknown.

**Etymology.** Nykta (Nyx in Greek) was born of Chaos, and was the primordial goddess of the night. Nykta stood at or near the beginning of creation, and was the mother of personified gods such as Hypnos (sleep) and Thánatos (death).

### *Ethmia zaguljaevi* Kostjuk, 1980

(Figs 19, 29)

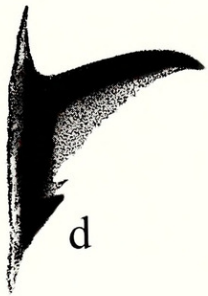
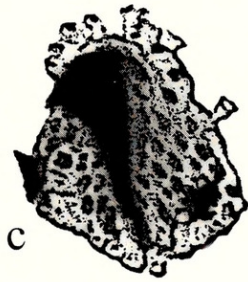
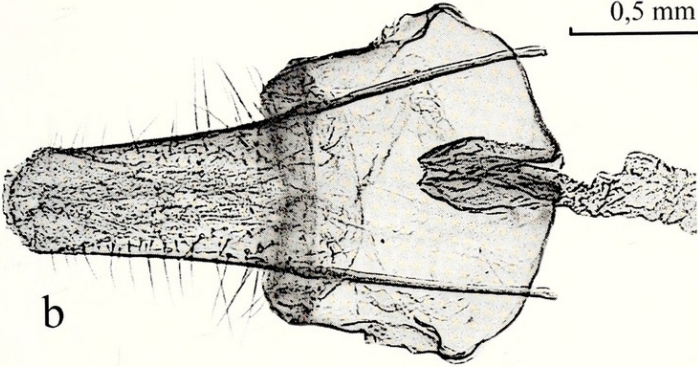
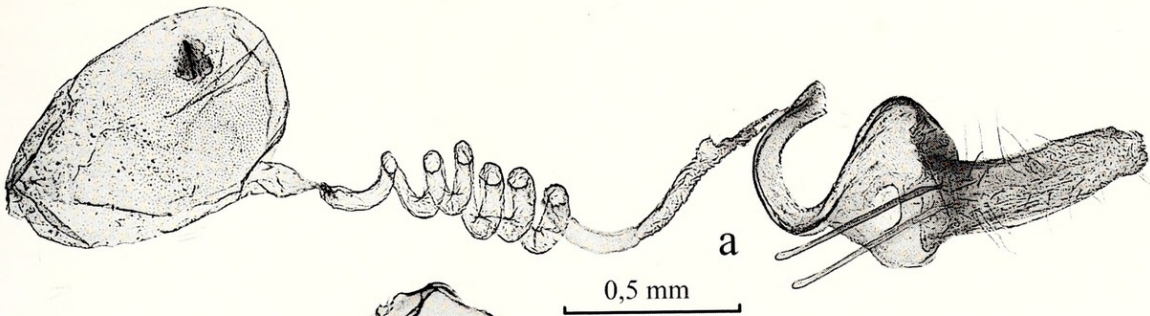
*Ethmia zaguljaevi* Kostjuk, 1980, Entomologicheskoe obozrenie **59**(4): 858, Figs 1, 2. Type locality: "Altai, Kuraisky hr. u rudn. Aktash, 2600 m, gornaya tundra" [Altai Republic, Kurai range, near Aktash pit, 2600 m, mountain tundra]. Holotype: male (ZMKU) [examined].

**Material.** Holotype ♂ with labels: 'Алтай, Курайский хребет | у Акташа, верхов. р. Ярлы– | Яры, 2600 м, горная тундра | 18 июня 1976 Ю.Костюк' [Russia, territory of Altai Republic, at the Aktash pit at 2600 m above sea level, 18. vi 1979, leg. Ju. Kostjuk] <white rectangle, print in black ink>, 'Алтай, Курайский хр | у рудн. Акташ, 2600 м | Костюк 18 vi 1976' [Russia, territory of Altai Republic, at the Aktash pit at 2600 m above sea level, 18. vi 1979, leg. Kostjuk] <white rectangle, print in black ink>, 'горная тундра' [mountain tundra] <white rectangle, print in black ink>, 'Holotypus *Ethmia | zaguljaevi* | ♂ Kostjuk' <red rectangle, written in black ink> (ZMKU). – Paratypes: 2 ♂, same data as holotype (ZMKU).

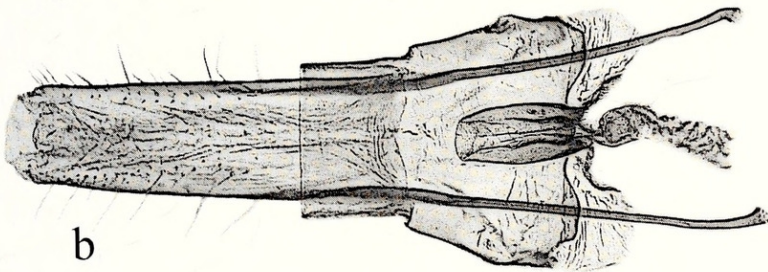
**Figs 7–9.** Female genitalia of *Ethmia* spp. **7.** *Ethmia falkovitshi* sp.n.: **a.** general view; **b.** ventral view; **c.** signum, dorsal view; **d.** signum right-side view. **8.** *Ethmia turkmeniella* Dubatolov et Ustjuzhanin, 1998, moth from Kalmykia, Russia: **a.** general view; **b.** ventral view; **c.** signum, dorsal view; **d.** signum right-side view. **9.** *Ethmia elimatella* Danilevsky, 1975, moth from Nakhichevan, Ordubad, Azerbaijan. **a.** general view; **b.** ventral view; **c.** signum, dorsal view; **d.** signum right-side view.



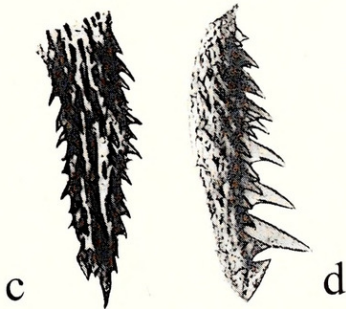
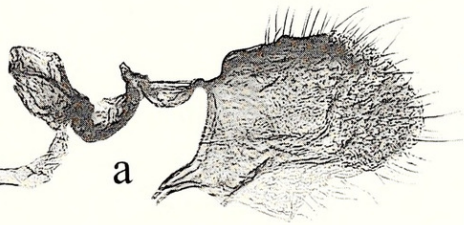
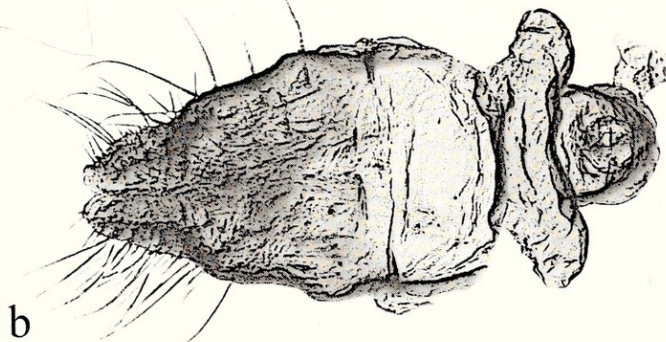
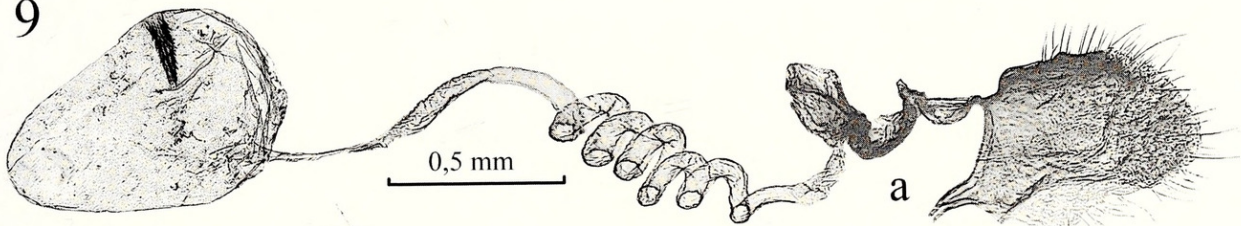
7



8



9





**Remarks.** Kostjuk (1980) stated that holotype was transferred to the Zoological Institute of the Russian Academy of Sciences (St. Petersburg, Russia), but this was not done and the specimen is actually kept in the Institute of Zoology, Ukraine Academy of Sciences, Kiev. The data cited below are based on the original description.

**Redescription** (Fig. 19). Wingspan of holotype 15.5 mm. Antenna with cilia, dark brown; labial palpus dark brownish. Proboscis slightly exceeding length of labial palpus. Thorax and tegulae shining, raven black-coloured. Forewing smooth, greyish black. Forewing markings formed by 3 large black spots. Hindwing of same colour as forewing, slightly transparent, costal brushes absent. Forelegs, midlegs, and hindlegs brownish black, tarsi with yellow scales. Abdomen from 4th segment laterally orange, from 7th segment entirely orange.

**Male genitalia** (Fig. 29). Valva long, pointed. Uncus developed, hood-like with two pointed hook-shaped bent processes. Caudal part of gnathos in form of triangularly expanded sclerotized formation armed with thorns, anterior part roughly sclerotized, with broad base. Labis' hornlike process rather long, slightly bent to top. Phallus gun-shaped, with one cornutus (Fig. 29).

Female unknown.

**Diagnosis.** The small size of the moths and three characteristic black spots on the forewing easily distinguish *Ethmia zaguljaevi* from other *Ethmia* species. Also the different shape and structure of the gnathos of the male genitalia are diagnostic.

**Distribution and life history.** The moths inhabit the territory of Altai Republic in SW Siberia, at the Aktash pit they are known from mountain tundra at the altitude of 2600 m. The biology and immature stages are unknown. The moths fly in June.

**Taxonomic notes.** The moth habitus and the structure of the male genitalia suggest a close relationship with the *bipunctella* and *chrysopyga* groups sensu Sattler (1967).

### *Ethmia elimatella* Danilevsky, 1975

(Figs 9, 11, 12, 22)

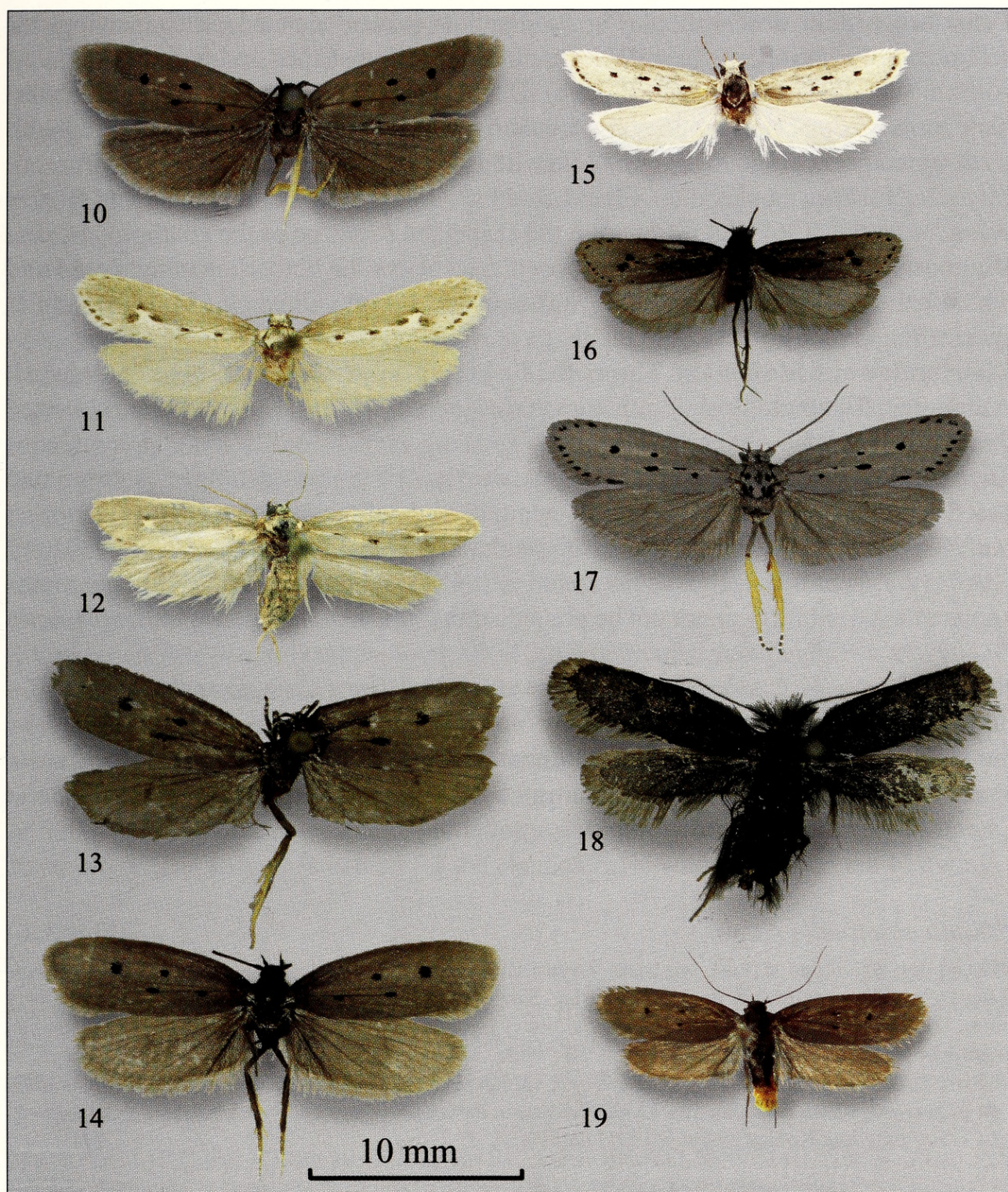
*Ethmia elimatella* Danilevsky, 1975, Entomogicheskoe obozrenie 54(3): 615. Fig. 1. Type locality: "Azerbaijan, Ordubad". Holotype: male (ZISP) [examined].

References: Danilevsky (1975: 615); Danilevsky (1976: 32); Danilevsky (1980: 334); Kun (2007: 104); Wei et al. (2007: 66) (*Ethmia*).

**Material.** Holotype ♂ with labels: '♂ | Ordubad', on the back '8.5.83, | Chr.' <white rectangle, in black ink>, 'кол. б. Вел Кн. | Николая | Михайловича' [collection of Grand Duke Nikolay Mikhailovich] <white rectangle, printed in black ink>, 'Holotypus. | *Ethmia* | *elimatella* Danil.' <red rectangle, written in black ink> (ZISP). – Additional material. 1♂, 1♀, Nus-nus, Araks river basin, Nakhichevan, Ordubad, Azerbaijan. 31.vii.1995 leg. Zagulajev (ZISP).

**Redescription** (Figs 11, 12). Wingspan of holotype 19.5 mm, female 20 mm. Antenna of male with cilia, antenna of female filiform, without cilia. Labial palpus smooth with clay-colored scales; base of proboscis with clay-colored scales; frons, vertex, tegulae, forelegs, midlegs, and hindlegs similarly clay-colored. Thorax with pale grey pattern. Costal half of forewing with grey scales, basal half white with 5 separated black spots placed below border of darker costal and dorsal half of wing; margin with 7 black dots; cilia pale grey. Abdomen pale grey without yellow scales.





**Figs 10–19.** Habitus of *Ethmia* spp. **10.** *Ethmia vidua flavilaterella* Danilevsky, 1975. Male, holotype (ZISP). **11–12.** *Ethmia elimatella* Danilevsky, 1975. **11.** Male, holotype (ZISP). **12.** Female, Nus-nus, Araks river basin, Nakhichevan, Ordubad, Azerbaijan (ZISP). **13–14.** *Ethmia soljanikovi* Danilevsky & Zaguljaev, 1975. **13.** Male, holotype (ZISP). **14.** Male, paratype, Mongolia, Hubsbul Province, Beltesin-Gol river (ZISP). **15.** *Ethmia turkmeniella* Dubatolov et Ustjuzhanin, 1998. Female, Russia, Kalmykia, left coast of the river of Volga, at settlement Chagan-Aman, Justinsky area (LSSU). **16.** *Ethmia sibirica* Danilevsky, 1975. Male, holotype (ZISP). **17.** *Ethmia uhsensis* Zagulajev, 1975. Male, holotype (ZISP). **18.** *Dasyethmia hiemalis* Danilevsky, 1969. Male, holotype (ZISP). **19.** *Ethmia zaguljaevi* Kostjuk, 1980. Male, holotype (ZMKU).



**Female genitalia description** (Fig. 9). Papillae anales rounded, setose; ovipositor sclerotized. Posterior apophyses absent; anterior wedge-shaped and pointed (Fig. 9a). Antrum sclerotized, very large (Fig. 9b). Ductus bursae very long, spiral, with 6 complete turns. Corpus bursae rather large, spherical. Signum large, trilobate, covered with teeth, asymmetric (Fig. 9c, d) in middle with roughly jagged crest.

**Male genitalia** (Fig. 22). Shape of valva similar to that of *E. infelix* and *E. derbendella* Sattler, 1967, but different in the shape and structure of the gnathos.

**Diagnosis.** The five separated black spots placed below the borderline of the costal and dorsal halves of the forewing easily distinguishes *Ethmia elimatella* from the similar species *E. infelix* Meyrick, 1914.

**Distribution and life history.** The moths are known only from the environs of Ordubad, Azerbaijan. The biology and immature stages are unknown. The moths were collected flying from early May to early July.

**Taxonomic notes.** Kun (2007) wrote in his review of the *wursteri* species group that based on an examination of the female genitalia slide of the paratype of *Ethmia kurdistanella* Amsel, 1959 (in coll. LNK; considered and figured as *E. infelix* by Sattler (1967) (the specimen itself was not found in LNK)) and the very few additional moths known, the possibility cannot not be precluded that this female belongs to *E. elimatella* Danilevsky, 1975 or even *E. persica* Kun, 2007.

*Ethmia elimatella* Danilevsky, 1975 was described from a single male, and the female of the species was unknown until now. A pair of *E. elimatella* was found by me in ZISP from the type locality (Ordubad, Azerbaijan). The genitalia of the female specimen were examined and it is confirmed here that female genitalia of *E. elimatella* Danilevsky 1975 were not figured earlier under any other species name.

### *Ethmia albolinella* sp. n.

(Figs 3, 6)

**Material.** Holotype ♂, 'ок. ур. Бана-Джун | Камъ, бас. Голубой | Козловъ. 1/2 iv 01 [environs Bana-Dzhun, Kam, valley of Goluboy River, leg. Kozlov. 1/2. iv.1901]' <white rectangle, printed in black ink>, 'HOLOTYPUS. | ♂ *Ethmia albolinella* Shovkoon | design. Shovkoon D. F. 2010' <red rectangle, printed in black ink> (ZISP). – Paratypes: 2♂, same data as holotype; 1♂, дол. Голубой р., Камъ, в. Тибетъ. Козловъ. 18 iii 01 [valley of Goluboy River Kam, eastern Tibet, leg. Kozlov. 18. iii.1901] (ZISP); 1♂, р. Дза-чю, Камъ Голубая 12–12500' Козловъ. нач. v 01 [Dza-chju River, Kam, Golubaja River, 12–12500 foot, leg. Kozlov. begin. v.1901] (ZISP).

**Description** (Fig. 3). Wingspan 17–18 mm, holotype 17 mm. Antenna filiform, black; flagellum black; maxillary palpus reduced. Labial palpus with black scales; base of proboscis with black scales; frons, vertex, thorax, tegulae, and forelegs uniformly black. Midlegs and hindlegs with femur black, tarsi with yellow scales. Forewing generally dark grey, almost black at base, cilia dark grey. Pattern consisting of three large black spots, a white to yellowish longitudinal streak, and tiny, black marginal dots; largest spot set at distal part of R-Cu cell, other two located one above other, approximately in center of wing; streak bordered with black scales and stretched from base of forewing to lower two spots. Abdomen: segments 4–7 laterally yellow, segments 7 and 8 entirely yellow.



Wing venation (Fig. 6c). Forewing: Sc vein set in middle of costal border of wing;  $R_4$  and  $R_5$  on long stalk (1/2 general long of veins). Hindwing:  $M_1$  connate or slightly stalked with  $M_2$ ;  $M_3$  slightly stalked with  $Cu_1$ .

Male genitalia (Fig. 6a, b). Uncus developed, bifurcated. Caudal part of gnathos armed with thorns, anterior part roughly sclerotized, with broad base. Labis short, bristly. Valva pyriform. Cucullus wide, convex. Phallus gun-shaped, with row of tooth-shaped cornuti terminating with long thorn (Fig. 6b).

Female unknown.

**Diagnosis.** The moth belongs to the *nigripedella* species group. Worn specimens of the new species are difficult to distinguish from *E. ultima* Sattler, 1967, although the wing background of *E. albolinella* is darker; the distal part of the R-Cu cell of the forewing has one big spot (three in *E. ultima*); the streak of *E. albolinella* is bordered uninterruptedly with a black line whereas the streak of *E. ultima* is only dotted with separate black scales; and the hindwing of *E. albolinella* is unicoloured whereas that of *E. ultima* has a yellow base.

The white streak on the forewing of *Ethmia albolinella* sp. n. is the most diagnostic feature which easily distinguishes it from other moths of the *nigripedella* species group.

In male genitalia the new species (Fig. 6a, b) is very similar to *E. nigripedella* and the little-known *E. sibirica* Danilevsky, 1975 (Fig. 26), *E. ubsensis* Zagulajev, 1975 (Fig. 27), and *E. menyuanensis* Liu, 1980 (see Liu 1980, 1982) which also belong to the same species group.

**Distribution and life history.** The moths were collected from the Chang Jiang river basin, Sichuan Province of Southwest China, from mid March to early May at an altitude of 3200–3700 m (Kozlov 1906). The biology and immature stages are still unknown.

**Etymology.** The species is named for the characteristic white streak on the forewing.

### *Ethmia sibirica* Danilevsky, 1975

(Figs 16, 26)

*Ethmia sibirica* Danilevsky, 1975, Nasekomye Mongolii [Insects of Mongolia], 3: 347. Figs 15, 16. Type locality: “SSSR, Buryatiya, Tunkinskie Belki, 2000 m”. Holotype: male (ZISP) [examined].

References: Zaguljaev (1975: 347), Danilevsky (1976: 32), Danilevsky (1980: 334), Sinev (1997: 514) (*Ethmia*).

**Material.** Holotype ♂ with labels: ‘Тунки́нск. белки | Ирк.г. 2000 м. vii | [от В. Хаас] 925’ [Russia, Republic of Buryatia, Tunkinskije Belki, Tunka-Alpen – part of the Eastern Sayan, 2000 m, vii.1925 (from Bang-Haas)] <white rectangle, print in black ink>, ‘Holotypus | *Ethmia sibirica* | Danilevsky, 1975’ <red rectangle, written in black ink> (ZISP). – Paratypes: 1 ♂, same data as holotype (ZISP).

**Redescription** (Fig. 16) Wingspan of holotype 15 mm, paratype 15 mm. Head, antenna, labial palpus in long black filaments. Thorax and tegulae with brownish black scales. Forewing smooth, brownish black, dark at base. Forewing markings formed by 4 black spots and one faint streak in wing base (Fig. 16). Black marginal dots also present, tiny. Hindwing transparent, dark grey. Legs black. Abdomen: segments 6–9 laterally orange, last two segments and genitalia with orange scales.



**Male genitalia** (Fig. 26). Valva rather pyriform with wide, convex, poorly lobate cucullus. Uncus developed, bifurcated. Caudal part of gnathos armed with thorns, anterior part roughly sclerotized, with broad base. Phallus gun-shaped, forming almost full ring, cornuti with row of teeth finished by long thorn (Fig. 26).

Female unknown.

**Diagnosis.** The species is similar in external characters to *E. ubsensis* Zagulajev, 1975 but differs in its smaller size and blacker colouring of forewings. It can easily be separated from *E. cirrhocnemis* and *E. comitella* by the location and form of the black spots on the forewings. In male genitalia the species is similar to *E. nigripedella*, *E. ubsensis* (Fig. 27), *E. menyuanensis*, and *E. albolinella* sp. n. (Fig. 6a, b) and differ in the shape of the valva and gnathos (Fig. 26).

**Distribution and life history.** The species is known from Buryatia Republic of Russia, Tunkinskije Belki, Tunka-Alpen in the Eastern Sayan. The biology and immature stages are unknown. The moths fly in July.

**Taxonomic notes.** The species belongs to the *nigripedella* species group, and from the forewing pattern may be close to *E. cirrhocnemis* (*bipunctella* species group), *E. comitella* and *E. ubsensis* (Fig. 17) (*nigripedella* species group). In the shape of the male genitalia it is close to *E. nigripedella*, *E. ubsensis* Zagulajev, 1975 (Fig. 27), *E. menyuanensis* Liu, 1980, and *E. albolinella* sp. n. (Fig. 6a, b) which also belong to the *nigripedella* species group. The male genitalia of the species differ in the shape of the valva and gnathos.

### *Ethmia ubsensis* Zagulajev, 1975

(Figs 17, 27)

*Ethmia ubsensis* Zagulajev, 1975, Nasekomye Mongolii [Insects of Mongolia], 3: 347. Figs 9–14. Type locality: “Mongoliya, Ubsu-Nurskii aimak, 30 km NE Barun-Turuna, peski” [Mongolia Uvs Aimag, 30 km NE of Baruunturuun, sands]. Holotype: male (ZISP) [examined].

References: Zagulajev (1975: 347) (*Ethmia ubsensis*), Danilevsky (1980: 334) (*Ethmia sibirica*), Sinev (1997: 514) (*Ethmia ubsensis*), Dubatolov et al. (1997) (*Ethmia ubsensis*).

**Material.** Holotype ♂ with labels: ‘Монголия, 30 км СВ | Барун-Туруна, пески | Убсунурский аймак | Емельянов 5 vii 968’ [Mongolia Uvs Aimag, sands, 30 km NE of Baruunturuun, 05.vii.1968] <white rectangle, print in black ink>, ‘Holotypus *Ethmia l ubsensis* Zag. sp.n. | Mongolia. ♂. det. A.Zag.’ <red rectangle, written in black ink> (ZISP). – Paratypes: 1 ♂ СССР, Тувинская АССР, пойма р. Тес-Хем у Эрзина, 26 vi 1969 Ю. Костюк [USSR, Tuva Republic, high-water bed of Tes-Khem river, near Erzin settlement 26.vi.1969, leg. Ju. Kostjuk] (ZISP).

**Additional material:** 1 ♂, Mongolia, Suchbaatar Aimag, Dzotol-han-ula, 21.vii.1976, leg. Gur’eva (ZISP); 1 ♂, Mongolia, Töv Aimag, SW Ulan Bator, environs Songino, steppe, 1.vii.1967, leg. Zaytcev (ZISP).

**Redescription** (Fig. 17). Wingspan 20 mm. Head, antenna, and labial palpus with dark grey scales. Thorax and tegulae dark grey, thorax with 4 black spots, tegulae with black spot at base. Forewing smooth, dark grey. Forewing markings formed by 4 or 5 black spots and 2 faint streaks (Fig. 17); first spot, of variable size, located in anal part of wing; second and third spots stacked approximately at 1/2 length of forewing; fourth spot – the largest – situated in distal end of cell (in moth from Tuva two more spots located below); first streak located in wing base, second between first and third spots;



margin with 10–12 oblong black marginal dots; cilia dark grey. Hindwing of same colour as forewing, without costal brushes. Forelegs and midlegs ash grey, hindlegs with femur ash grey with orange scales, tarsus black with orange bonding. Abdomen orange from second segment.

**Male genitalia** (Fig. 27). Valva rather pyriform with wide, convex, poorly lobate cucullus. Uncus wide, bifurcated, with narrow clasps bent aside valvae. Caudal part of gnathos membranous, without sclerotized arms, anterior part roughly sclerotized, with spinules. Phallus gun-shaped, forming almost full ring, cornuti with row of teeth terminating in long thorn (Fig. 27).

Female unknown.

**Diagnosis.** The moth differs from *E. sibirica* by the large size and more grey colouring of the forewings, also by the different shape and structure of the gnathos of the male genitalia.

**Distribution and life history.** The moths were collected from Uvs Suchbaatar and Töv Aimags of Mongolia and Tuva Republic of Russia, high-water bed of Tes-Khem river. The biology and immature stages are unknown. The moths fly from mid June to early July.

**Taxonomic notes.** The species belongs to the *nigripedella* species group, with similar forewing pattern as *E. cirrhocnemis* (Lederer, 1870) (*bipunctella* species group), *E. comitella* Caradja, 1927 and *E. sibirica* Danilevsky, 1975 (Fig. 16) (*nigripedella* species group). The male genitalia are similar to those of *E. nigripedella* (Erschoff, 1877), *E. sibirica* Danilevsky, 1975 (Fig. 26), *E. menyuanensis* Liu, 1980, and *E. albolinella* sp. n. (Fig. 6a, b), which all belong to the *nigripedella* species group.

According to Kuznetsov, who prepared the paper by Danilevsky (1980) for publication, *E. ubsensis* Zagulajev, 1975, should be synonymized with *E. sibirica* Danilevsky, 1975. In contrast, Sinev (1997) again separated these taxa based on a number of characters: *E. ubsensis* is larger (wingspan: 20 mm), with hind wings not translucent, and the apex of the gnathos has two closely-set blunt processes, while in *E. sibirica* these processes are pointed and widely set.

### ***Ethmia soljanikovi* Danilevsky & Zaguljaev, 1975 (Figs 13, 14, 23–25)**

*Ethmia soljanikovi* Danilevsky & Zaguljaev, 1975, Nasekomye Mongolii [Insects of Mongolia], 3: 343. Figs 1–8. Type locality: “Mongoliya, Dzabhansky aimak, severnaya okraina Hangaichkogo nagor’ya, listvennichnyi les s redkimi polyanami 1500–1600 m” [Mongolia, Zavkhan Province northern suburb of Hangajsk upland, larch forest with rare glades, 1500–1600 m]. Holotype: male (ZISP) [examined].

References: Zaguljaev (1975: 343), Danilevsky (1976: 32), Danilevsky (1980: 334) (*Ethmia*).

**Material.** Holotype ♂ with labels: ‘Монголия, Дзаб ♂ | Хангайское нагорье | h = 1500–1600 м. | Соляников 6.8.65’ <white rectangle, written in black ink>, ‘Holotypus *Ethmia* | *soljanikovi* | Zag. sp.n. | “Монголия”.’ <red rectangle, written in black ink> [Mongolia, Zavkhan Province, northern suburb of Hangajsk uplands, larch wood with rare glades, 1500–1600 m, 06.viii.1965 leg. Soljanikov] (ZISP). – Paratypes: 1 ♀ 1 ♂ same data as holotype; 1 ♂ Улан-Эриг близ Улясутая, 2 vii 1911 (Югранова) [Mongolia, Zavkhan Province, near Uliassutai 02.vii.1911 leg. Jugranova] (ZISP); 1 ♂ Хубсугульский аймак: р.Уджигин-Гол, сухая каменистая степь среди лиственничников, (Соляников) 19 vi 1965 [Mongolia, Khuvsgul Province, river Udzhin-Gol, dry stony steppe among larch forest 19.vi.1965 leg.



Soljanikov] (ZISP); 1 ♂ р. Ар-сайн-Гол, 21 vi 1965, (Соляников) [Mongolia, Hubsbul Province, Arsain-Gol river 21vi.1965 leg. Soljanikov]; 2 ♂ р. Бэлтэсин-Гол, 25 vi 1965 (Соляников) [Mongolia, Hubsbul Province, Beltesin-Gol river 25.vi.1965 leg. Soljanikov] (ZISP); 3 ♂ СССР Тувинская АССР горный массив Могу́н-Тайга, вост. берег оз. Хиндиктиг-Холь, 3500 м на альпийском лугу 13.vii 1969 (Костюк) [Russia, Tuva Republic, Mongun-Tayga mountains, east coast of lake Khindiktig-Khol, 3500 m, alpine meadow, 13.vii 1969 leg. Kostjuk] (ZISP).

Additional material (from Dubatolov et al. 1997). Altai Republic: 4 ♂, the Yuzhno-Chuyskii Mountain Range, the headwater of the Kokuzek River, 2500 m, 5, 11 vii, 1 viii 1982 (Perunov et Goljakov leg.) (SZMN); 1 ♂, 80 km E of Kosh-Agach, 4 km NW of the Sailyugem Mountain, 2300–2400 m, 14 vii 1996 (A. et R. Dudko leg.) (SZMN); 1 ♂, Altaiskii Nature Reserve, the Shapshal Mountain Range, no other data (N. Zolotukhin leg.) (SZMN) (Not examined).

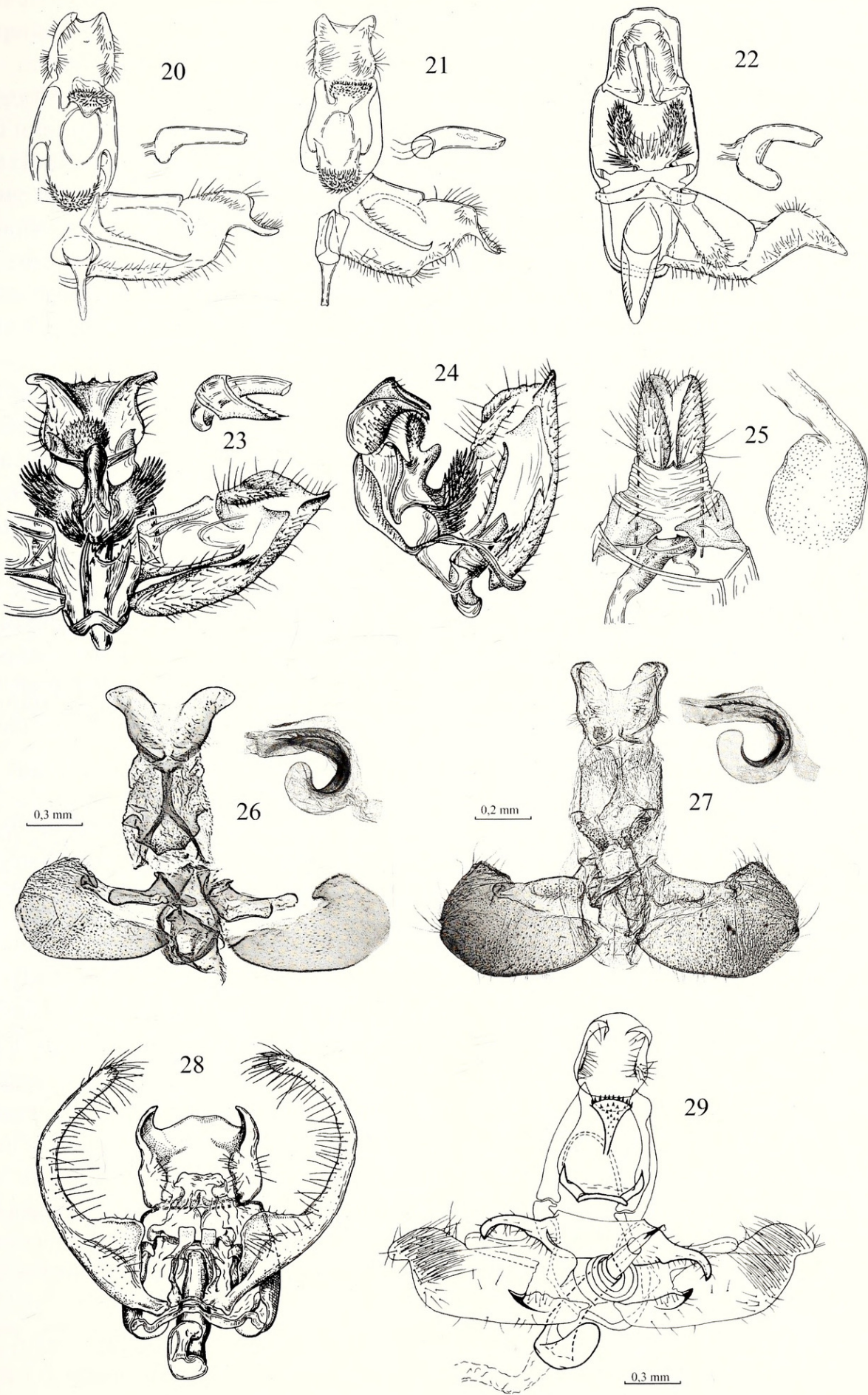
**Redescription** (Figs 13, 14). Wingspan of holotype 22 mm, female 26 mm. Head, antenna, labial palpus of male with blackish scales, those of female with brown tint. Tegulae of male with dark grey scales, that of female with black spot at base. Forewing smooth, greyish black, with faint tints of brown. Forewing markings formed by 4 large black spots and one faint streak at wing base; first spot of variable size, located in anal part of wing; second and third spots stacked approximately at 2/5 lengths of wing; fourth spot – largest – in distal part of cell. External edge of forewing and cilia without black spots and streaks. Hindwing more greyish than forewing; costal brushes absent. Forelegs and midlegs of male greyish black, hindlegs with femur black, tarsi with yellow scales. Female midlegs similarly greyish black, hindlegs with femur black, tarsi with bright orange. Abdomen of male segments 5 and 6 laterally orange, segment 8 and scale cover of genitalia with orange scales; female abdomen orange beginning with second segment.

**Male genitalia** (Figs 23, 24). Valva rather rectangular with straight external edge of cucullus and extended serrate bottom edge; sacculus extend to middle valva. Uncus developed, wide with narrow clasps bent laterally to valva. Caudal part of gnathos hemisphere-shaped, armed with spinules, anterior part of gnathos armed with long thorns. Labis thin, long, slightly bent to top. Phallus gun-shaped, without cornuti.

**Female genitalia** (Fig. 25). Papillae anales rounded, setose; ovipositor sclerotized. Posterior apophyses slender, as long as papillae; anterior ones wedge-shaped and pointed (Fig. 7a, c). Antrum sclerotized, armed three rows of thorns. Corpus bursae rather large, spherical, covered with spinules.

**Figs 20–29.** Male genitalia and female genitalia of *Ethmia* spp. **20.** Male genitalia of *Ethmia vidua flavilaterella* Danilevsky, 1975, holotype (after Danilevsky, 1975). **21.** Male genitalia of *Ethmia vidua vidua* (Staudinger, 1879), holotype (after Danilevsky, 1975). **22.** Male genitalia of *Ethmia elimatella* Danilevsky, 1975, holotype (after Danilevsky, 1975). **23–25.** *Ethmia soljanikovi* Danilevsky & Zaguljaev, 1975. **23.** Male genitalia, holotype, general view and **(24.)** ventral view (after Zaguljaev, 1975) (ZISP). **25.** Female genitalia, paratype (after Zaguljaev, 1975). **26.** Male genitalia of *Ethmia sibirica* Danilevsky, 1975, holotype, prep. № 4558 (ZISP). **27.** Male genitalia of *Ethmia absensis* Zaguljaev, 1975, holotype, prep. № 13373 (ZISP). **28.** *Dasyethmia hiemalis* Danilevsky, 1969, male genitalia, paratype (after Danilevsky, 1969). **29.** *Ethmia zaguljaevi* Kostjuk, 1980, male genitalia, paratype (after Kostjuk, 1980).







**Diagnosis.** The species is similar in external characters and female genitalia to *E. xanthopleura* Meyrick, 1931, but differs in having four spots on the forewing. The shape of the male genitalia easily distinguishes *Ethmia soljanikovi* from *E. xanthopleura*.

**Distribution and life history.** For a long time the species was known only from Mongolia (Zavkhan Province, Khuvsgul Province, Hubsbul Province) and from Russia (Tuva Republic, Mongun-Tayga mountains, and the east coast of lake Khindiktig-Khol).

Dubatolov et al. (1997) recorded its presence in the Altai (Yuzhno-Chuyskii Mountain Range, headwater of Kokuzek River; Kosh-Agach Sailyugem Mountain; Altaiskii Nature Reserve, Shapshal Mountain Range). The biology and immature stages are still unknown. The moths were collected in dry stony steppe among larch forest and in alpine meadows at 2500–3500 m in elevation. The moths fly from the second half of June to early August.

**Taxonomic notes.** The species is similar in external characters and female genitalia to *E. xanthopleura* Meyr (*nigripedella* species group), but the shape of the male genitalia is similar to that of *E. vidua* Staudinger (*aurifluella* species group). It is very difficult to attribute this species to any of the groups of species suggested by Sattler (1967) for the Palaearctic Region, and probably the species occupies an isolated systematic position.

### *Dasyethmia hiemalis* Danilevsky, 1969

(Figs 18, 28)

*Dasyethmia hiemalis* Danilevsky, 1969, Entomologicheskoe obozrenie **48**(1): 178. Figs 1–4. Type locality: “Kazakhstan, srednee techenie r. Chu, Koskudukskaya saksaul’naya lesnaya dacha” [Kazakhstan, middle course of Chu river, Koskuduksky saxaul wood summer residence]. Holotype: male (ZISP) [examined].

References: Danilevsky (1969), Zaguljaev (1975: 347), Danilevsky (1976: 32), Danilevsky (1980: 336) (*Dasyethmia*).

**Material.** Holotype ♂ with labels: ‘КазССР, р. Чу, | Коскудукский | саксаул. Лесхоз | 25.i.1941 г. Б.Кравцов’ [**Kazakh SSR**, Chu river, Koskuduk saxaul, 25.i.1941 leg. B. Kravtsov] <white rectangle, written in black ink>, ‘Holotypus ♂ | *Dasyethmia* | *hiemalis* Danil.’ <red rectangle, written in black ink> (ZISP). – Paratypes: 3 ♂. same data as holotype (ZISP).

**Redescription** (Fig. 18). Wingspan 20–22 mm, holotype 21 mm. Whole body and wings unicolorous black. Antenna densely ciliated, reaching 2/3 of forewing length. Labial palpus large, triarticulate; second segment about 2/3 total length of palpus; final segment thin, pointed, almost three times shorter than second segment. Head densely covered by thin and very long black hairs as long as thorax. Labial palpus, tegulae, and base of legs with same dense hair cover. Femur of forelegs with well developed epiphysis; midlegs with pair of spurs; hindlegs much longer than midlegs, femur with long hair brush and armed with two pairs of spurs. External margin of forewing and cilia without dark spots and streaks; cilia black, very wide, consisting of racemose and piliform scales. Hindwing coloured as forewing, costal brushes absent, cilia black, very wide (more than half of wing width).

**Male genitalia** (Fig. 28). Gnathos absent. Transtilla simple, weakly sclerotized. Valva strongly extended, narrow. Uncus developed, very wide, lateral corners extended in powerful hornlike processes. Phallus gun-shaped, without cornutus.



Female unknown, probably apterous.

**Diagnosis.** Apart from the very early flight period of the moth, the dense hairy cover and almost full reduction of the proboscis easily distinguishes *Dasyethmia hiemalis* from other *Ethmia* species. The absence of a gnathos in the male genitalia is characteristic too.

**Distribution and life history.** The species was described from the sands of Kazakhstan, where it inhabits the middle course of the Chu river. The biology and immature stages are unknown. The moths are January day-fliers (!) in saxaul bush.

**Taxonomic notes.** According to Danilevsky (1969) genus *Dasyethmia* differs from genus *Ethmia* Hübner, 1819 in a number of characters. Some of them, such as the dense hairy cover and almost full reduction of proboscis, reflect the winter way of life of the moth. This trait of specialization, although of unclear adaptive value, is expressed in other features of the morphology of *Dasyethmia*. In wing venation – the truncated median cell and strong narrowing anal part of the hindwing, that brings to full loss of vein  $A_2$ . Vein  $A_2$  in *Ethmia* species is much thinner than others, but always present, and often bent in a characteristic way. Possibly, these features of venation are connected with the unusually long, wide cilia. In the male genitalia, the full reduction of the gnathos and simplification of the transtilla are characteristic of *Dasyethmia*. All these traits and specializations suggest the systematic isolation of *Dasyethmia*. However, until a phylogenetic analysis is done, it will be impossible to determine if this taxon should remain isolated from *Ethmia* or not. Nevertheless, all main traits of the structure of wings and genitalia are typical of the Ethmiidae (Danilevsky 1969). The genus *Dasyethmia* remains still monotypical.

### Acknowledgments

I am indebted to Dr Sergey Yu. Sinev (St. Petersburg) for providing access to the collections of ZISP. I want to thank D. András Kun (Budapest) for his active cooperation, consultations, and for providing some literature on Ethmiidae. I wish to express my sincere thanks to Dr Vadim V. Zolotuhin (Uljanovsk) for help at all stages of the preparation of the paper. I am indebted to Dr Igor' Ju. Kostjuk (Kiev) for kind cooperation and providing images of the holo- and paratype of *Ethmia zaguljaevi* Kostjuk, 1980. I want to thank Dr Tatyana A. Trofimova (Samara) for her friendly support and help during the preparation of the paper. I am very grateful to Dr Alexey S. Pazhenkov (Samara) for his friendly support and for the organization of expeditions to Kazakhstan. I am very grateful to Dr Paul Sokoloff for improvements to the language of the manuscript. Also, I am very thankful to the referees for reviewing and improving the manuscript.

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