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RESEARCH ARTICLE

# New and interesting records of early spring and late autumn Heterocera species (Insecta, Lepidoptera) in Altai Republic (Russia, South Siberia)

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## Abstract

Twenty two species from the families of Chimabachidae, Ethmiidae, Crambidae, Geometridae, Lasiocampidae, Lemoniidae, Sphingidae, Erebidae and Noctuidae are reported from Altai Republic of Russia. Seven species are new to the Russian Altai among them *Dasystoma salicella* (Hübner, 1796), *Ethmia aurifluella* (Hübner, 1810), *Ethmia discrepitella* (Rebel, 1901), *Agriphila deliella* (Hübner, 1813), *Rheumaptera neocervinalis* (Inoue, 1982), *Lemonia dumi* (Linnaeus, 1761), *Hyles churkini* (Saldaitis et Ivinskis, 2006). New data on 15 rare and local species provided.

## Keywords

Lepidoptera, Chimabachidae, Ethmiidae, Crambidae, Geometridae, Lasiocampidae, Lemoniidae, Sphingidae, Erebidae, Noctuidae, West Siberia, Altai Republic, Russian Altai, fauna, new records

## Introduction

The fauna of Heterocera of the Altai Republic has been studied very fragmentarily and unevenly. Noctuid fauna only have been studied and published quite well and in detail (Volynkin 2012). There are still no generalizing works on other families.

A fairly detailed review of the materials collected in Altai in 2016 was published by European and Russian entomologists (Huemer et al. 2017). We find some information in the catalog of Lepidoptera of Russia (Sinev 2019), where species records from the Altai Republic are listed in column 24, separately allocated for this region. The list of additions and clarifications to the data of mentioned catalog was published by the first author of this work (Knyazev 2023). In the spring of 2025, we undertook two expeditions in mid-April and mid-May to study the early spring complex of Lepidoptera species in the region. We also conducted an expedition in autumn, at the end of September, to check the composition of the late autumn fauna of Heterocera species. In the course of the work, very interesting materials were collected, which served as the basis for this publication. In this article we indicate only species that are new to the Altai Republic, or rare and local species, information on which may be of significant interest in context of the insufficient study of the distribution and biology of these species. The remaining materials will be published by us in subsequent works.

## Materials and methods

All material processed within the framework of this article was collected on the territory of Altai Republic by the authors using standard method of collecting by butterfly net and on Mercury lamps, also we used sex pheromones for different species by Pherobank. All collected specimens are deposited in the collections of Svyatoslav Knyazev (CSKO, Omsk, Russia) and Vadim Ivonin (CVIN, Novosibirsk, Russia). The photos were made using a Canon EOS 5D Mark II camera with a Canon EF-100mm macro lens. The images of the genitals were obtained using various devices: Nikon stereomicroscope (model: SMZ25) coupled with a Nikon digital camera (model: DS-Ri2) and processed with NIS-Elements BR software (in Zoological Institute of the Russian Academy of Sciences, St. Petersburg) also using Canon EOS 5D Mark II camera with a Canon MP-E 65 f2.8 lens, as well as an AmScope binocular microscope with RS-500C portable camera. The map was prepared using the Google-Earth program (Fig. 1). Localities were imported into it from a csv-file.

**List of collecting localities:**

Aktash – Ulagansky district, Aktash vill., h=1550 m, 50.334147, 87.649947 (Fig. 2);

Chibit – Ulagan district, 11 km W of Chibit vill., h=1100 m, 50.361052, 87.356182 (Fig. 3);

Chike-Taman – Ongudai district, Northern side of Chike-Taman Pass, h=1150, 50.638851, 86.296371 (Fig. 4);

Kokorya – Kosh-Agach district, 4 km NW of Kokorya village, Kyzylshyn river valley, h=1850, 49.940942, 89.043307 (Fig. 5);

Kurai – Kosh-Agach district, 4 km W of Kurai village, h=1630, 50.245907, 87.875216 (Fig. 6);

Stepushka – Ongudai district, 1,3 km NE of Stepushka boundary, h=750 m, 50.763610, 86.420060 (Fig. 7);

Tebeler – Kosh-Agach district, 5 km NE of Tebeler village, Kyzylshyn River valley, h=1800 m, 49.932424, 88.857395 (Fig. 8);

Telengit-Sortogoi – Kosh-Agachsky district, 7 km E of Telengit-Sortogoi vill., h=2000, 50.000087, 88.844735 (Fig. 9).

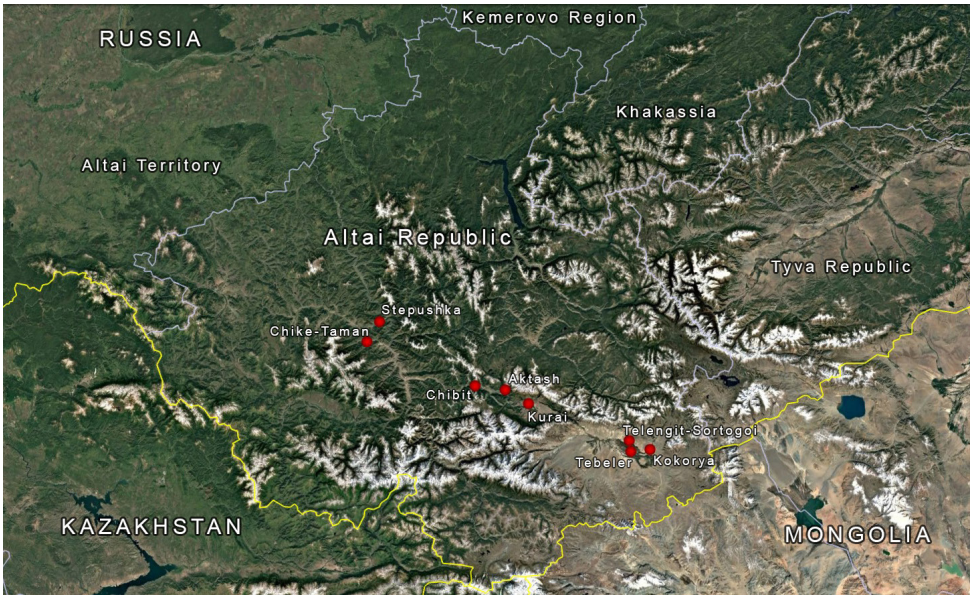



**Figure 1.** Map of the collecting localities in Altai Republic.

## Results

### Chimabachidae

****Dasystoma salicella*** **(Hübner, 1796)**
Fig. 10

**Material examined.** 1♂, Chibit, 11.04.2025, S.A. Knyazev (CSKO); 1♂, Chike-Taman, 14.04.2015, S.A. Knyazev (CSKO).

**Remark.** New to Altai Republic. This Transpalaearctic early-spring species is widely distributed in Russia (Lvovsky 2006; Sinev 2019) but it was never registered in the Altai Mountains. The nearest known localities of this species in Siberia are in South-West Siberian Region and in Irkutsk Region (Sinev 2019, Knyazev 2022).

**Ethmiidae**

****Ethmia aurifluella* (Hübner, 1810)**
Figs 11, 30

**Material examined.** 20♂♂, Kurai, 9-10.05.2025, S.A. Knyazev (CSKO).

**Remark.** New to Altai Republic and the easternmost find of the species. Males were attracted at pheromones. Previously known records from the territory of Siberia were in the South-West Siberian Region (Lvovsky and Knyazev 2012; Sinev 2019; Knyazev 2022).

****Ethmia discrepitella* (Rebel, 1901)**
Figs 12, 13, 31

**Material examined.** 1♂, Chike-Taman, 11.04.2025, S.A. Knyazev (CSKO); 5♂♂, 1♀ Kurai, 9-10.05.2025, S.A. Knyazev (CSKO).

**Remark.** New to Altai Republic and the easternmost find. Previously known records in Siberia were in Pre-Altai Region (Dubatolov et al. 1997; Shovkoon 2008; Shovkoon and Sachkov 2014; Sinev 2019).

**Crambidae**

****Agriphila deliella* (Hübner, 1813)**
Figs 14, 32

**Material examined.** 2♂♂, Stepushka, 14-15.09.2025, S.A. Knyazev (CSKO).

**Remark.** New to Altai Republic. This species is widespread in the European part of Russia up to the southern Urals (Sinev 2019). There is also an indication of this species for the West Siberian Plain (Slamka 2008) without specifying locations.

**Geometridae**

***Leucobrephos middendorfii* (Ménétriés, 1858)**
Fig. 15

**Material examined.** 2♂, Chike-Taman, 14.04.2015, S.A. Knyazev (CSKO).

**Remark.** Rare early-spring species widespread in the Arctic territories of Eurasia and in the mountainous regions of Siberia (Sinev 2019). It was previously reported for the Altai Republic from the Seminsky Pass (Knyazev 2023).


**Figures 2–9.** Habitats: **2** – Aktash, 19.09.2025; **3** – Chibit, 16.09.2025; **4** – Chike-Taman, 13.05.2025; **5** – Kokorya, 23.06.2015; **6** – Kurai, 13.04.2025; **7** – Stepushka, 16.09.2025; **8** – Tebeler, 11.05.2025; **9** – Telengit-Sortogoi, 18.09.2025.

***Lignyoptera fumidaria* (Hübner, 1825)**
Fig. 16

**Material examined.** 4♂, Aktash, 19-20.09.2025, S.A. Knyazev, V.V. Ivonin (CSKO, CVIN).

**Remark.** The present record is the second for Russian Altai. Previously this species was reported from Altai Nature Reserve (Vasilenko 2001). In addition, we previously indicated this species for Eastern and Northern Kazakhstan (Knyazev et al. 2021; Zuban` et al. 2024).

***Semidesertobia ubinica* Beljaev, 2000**
Fig. 17

**Material examined.** 1♂, Chibit, 11.04.2025, S.A. Knyazev (CSKO).

**Remark.** The present record is the third from the territory of Russia and the second from Altai Republic. This species was previously reported from Tyva Republic (Knyazev 2019) and from Ongudai vicinity in Altai Republic (Knyazev 2023).

***Erannis jacobsoni* (Djakonov, 1926)**
Fig. 18

**Material examined.** 17♂, Aktash, 19-20.09.2025, S.A. Knyazev, V.V. Ivonin (CSKO, CVIN); 5♂, Kurai, 16-17.09.2025, S.A. Knyazev, V.V. Ivonin (CSKO, CVIN).

**Remark.** The species is widespread in South Siberian mountains and on Russian Far East (Sinev 2019). Our findings complement the range of the species in Altai Mountains.

***Larentia clavaria* (Haworth, 1809)**
Fig. 19

**Material examined.** 1♂, Stepushka, 15-16.09.2025, S.A. Knyazev (CSKO).

**Remark.** The species is widespread in Russia from European Part to Altai Republic (Sinev 2019). Our finding complement the range of the species in Altai Mountains.

****Rheumaptera neocervinalis* (Inoue, 1982)**
Figs 20, 33.

**Material examined.** 1♂, 3♀, Chike-Taman, 13-14.05.2015, S.A. Knyazev , V.V. Ivonin (CSKO; CVIN); 1♂, Stepushka, 14-15.05.2025, S.A. Knyazev (CSKO).

**Remark.** First record of the species in West Siberia and in Altai Republic. Previously known records were in Baikal Region and from Russian Far East – Amur Re-

gion, Khabarovsk and Primorye Territories (Makhov and Beljaev 2019; Sinev 2019). This species differs most reliably from *R.cervinalis* in the genitalia of the females (Fig. 33).

**Lasiocampidae**

***Poecilocampa populi* (Linnaeus, 1758)**

**Material examined.** 1♂, Stepushka, 14-15.09.2025, S.A. Knyazev (CSKO).

**Remark.** This late autumn species is widespread both in the European part of Russia and in Siberia (Sinev 2019). New finding complement the range of the species in Altai Mountains.

***Phyllodesma yakovlevi* Zolotuhin, 2015**
Fig. 21

**Material examined.** 11♂♂, Chike-Taman, 8-9.05.2025, S.A. Knyazev (CSKO); 1♂, Kurai, 9-10.05.2025 (CSKO); 1♂1♀, Tebeler, 10-11.05.2025, S.A. Knyazev, V.V. Ivonin (CSKO; CVIN); 4♂♂, Stepushka, 14-15.05.2025, S.A. Knyazev (CSKO).

**Remark.** This local South-Siberian mountain species was described in 2015 from Tyva Republic and Altai Republic, near Chagan-Uzun (Zolotuhin 2015). New finds expand the range of the species in the Altai Republic.

**Lemoniidae**

******Lemonia dumi* **(Linnaeus, 1761)**
Fig. 22

**Material examined.** 2♂♂, 6♀♀, Chibit, 16-17.09.2025, S.A. Knyazev, V.V. Ivonin (CSKO, CVIN).

**Remark.** First record in Altai Republic. The species is widely distributed in Russia from European Part through South Siberia to the Amur Region (Sinev 2019). This species was not reliably known in Altai mountains, but in the Catalog of Lepidoptera of Russia it was indicated as questionable for this region. Our finding confirms the presence of the species in the region.

**Saturniidae**

***Eudia pavonia* (Linnaeus, 1758)**
Fig. 23

**Material examined.** 4♂♂, 2♀♀ Chike-Taman, 8-9.05.2025, S.A. Knyazev, V.V. Ivonin (CSKO); 7♂♂, Kurai, 9-10.05.2025, S.A. Knyazev (CSKO); 2♂♂, Chike-

Taman, 13-14.05.2025, S.A. Knyazev (CSKO); 23♂♂, Stepushka, 14-15.05.2025 (CSKO).

**Remark.** Transpalaearctic widely distributed in Russia (Sinev 2019) early-spring species. The males were attracted by pheromones (Pherobank), the females flew at the light of Mercury lamps. New finds clarify distribution of the species in the Altai Republic.

## Sphingidae

### **Hyles churkini* (Saldaitis et Ivinskis, 2006)

Fig. 24

**Material examined.** 1♂, Kokorya, 23-24.06.2015, S.A. Knyazev (CSKO); 7♂♂, Stepushka, 14-15.05.2025, S.A. Knyazev (CSKO).

**Remark.** The present records are the first indications of this species to Russia and to Altai Republic. The species was described from Mongolia by two males collected on the South Altai in Gobi Altai Aimak (Saldaitis and Ivinskis 2006). After that it was recorded from Howd Aimak in SW Mongolia (Yakovlev et al. 2015). Our findings in Russian Altai show a wider distribution of the species within the Altai mountain country.

## Erebidae

### *Autophila rasilis* (Püngeler, 1900)

**Material examined.** 1♀, Stepushka, 15-16.09.2025, S.A. Knyazev (CSKO).

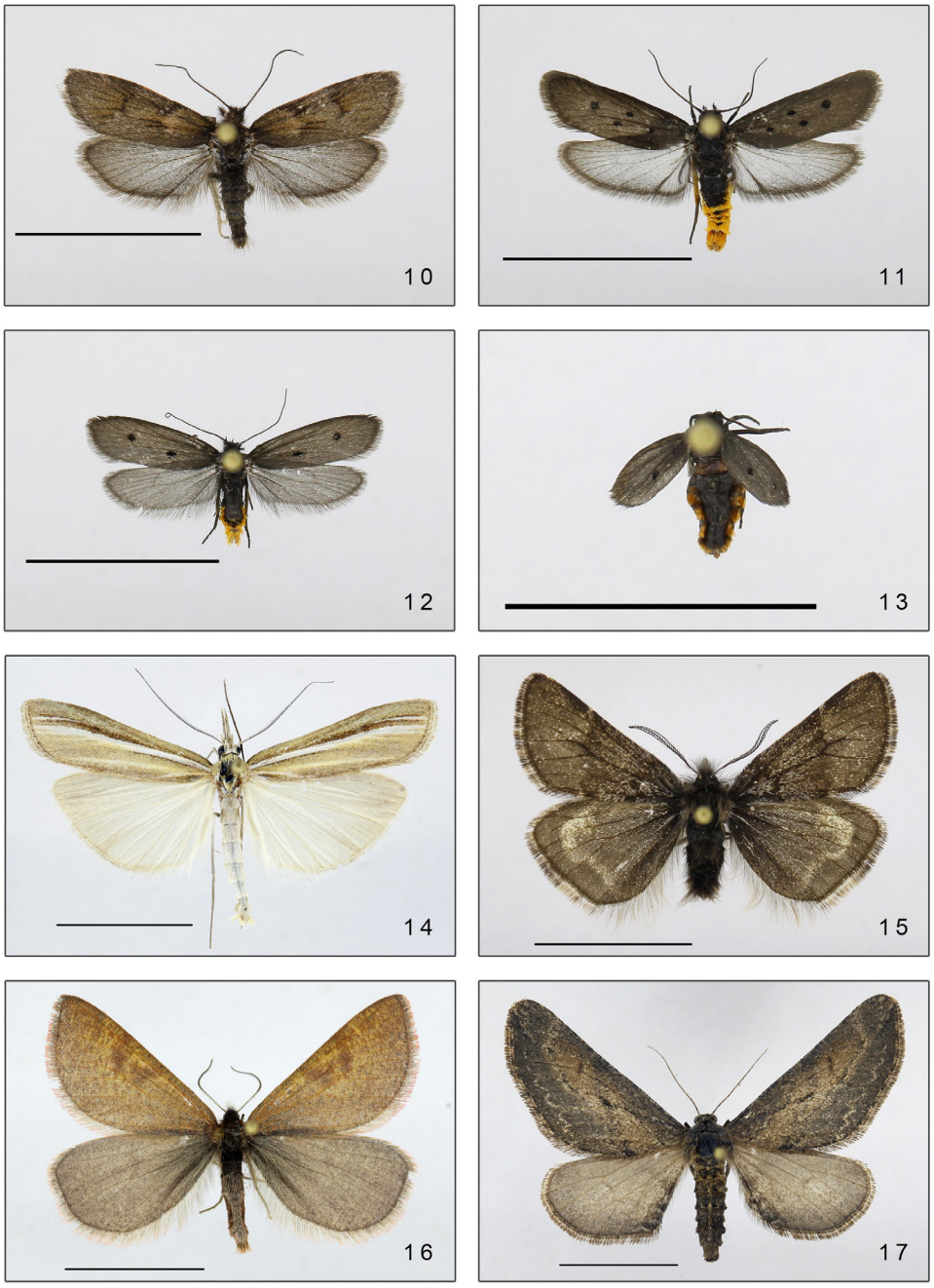
**Remark.** Rare and little-known species distributed in Russia in Altai Republic only (Volynkin 2012; Sinev 2019). We also report this species from Mongolia previously (Knyazev et al. 2020). Our record is the northernmost for the species.

### *Epatolmis caesarea* (Goeze, 1781)

Fig. 25

**Material examined.** 3♂♂, Chike-Taman, 8-9.05.2025, S.A. Knyazev, V.V. Ivonin (CSKO; CVIN); 3♂♂, Stepushka, 14-15.05.2025, S.A. Knyazev (CSKO).

**Remark.** Rare species in West Siberia (Dubatolov 2010; Knyazev 2020). Our findings clarify the distribution of the species in the Altai Republic.




**Figures 10–17.** Adult specimens of Lepidoptera, upper side (Scale 10 mm): **10** – *Dasystoma salicella*, Chike-Taman (CSKO); **11** – *Ethmia aurifluella*, Kurai (CSKO); **12** – *Ethmia discrepitella*, ♂, Kurai (CSKO); **13** – *Ethmia discrepitella*, ♀, Kurai (CSKO); **14** – *Agriphila deliella*, Stepushka (CSKO); **15** – *Leucobrephos middendorfii*, Chike-Taman (CSKO); **16** – *Lignyoptera fumidaria*, Aktash (CSKO); **17** – *Semidesertobia ubinica*, Chibit (CSKO).


**Figures 18–25.** Adult specimens of Lepidoptera, upper side (Scale 10 mm): **18** – *Erannis jacobsoni*, Kurai (CSKO); **19** – *Larentia clavaria*, Stepushka (CSKO); **20** – *Rheumaptera neocervinalis*, Stepushka (CSKO); **21** – *Phyllodesma yakovlevi*, Chike-Taman (CSKO); **22** – *Lemonia dumi*, ♂, Chibit (CSKO); **23** – *Eudia pavonia*, Stepushka (CSKO); **24** – *Hyles churkini*, Stepushka (CSKO); **25** – *Epatolmis caesarea*, Stepushka (CSKO).

**Noctuidae**

***Sympistis strioligera* Lederer, 1853**
Fig. 26

**Material examined.** 2♂, Kurai, 16-17.09.2025, S.A. Knyazev, V.V. Ivonin (CSKO, CVIN); 2♀, Aktash, 19-20.09.2025, S.A. Knyazev, V.V. Ivonin (CSKO, CVIN).

**Remark.** A rare species known in Russia only in the Southern Urals and Altai (Volynkin 2012; Kononenko 2016; Sinev 2019).

**Fabula zollikoferi (Freyer, 1836)**
Fig. 27

**Material examined.** 1♂, Telengit-Sortogoi, 17-18.09.2025, S.A. Knyazev (CSKO).

**Remark.** This species is widespread both in the European part of Russia and in Siberia up to the Altai Mountains (Kononenko 2016; Sinev 2019). New finding complement the range of the species in Altai Republic.

***Oxytripia orbiculosa* (Esper, 1799)**
Fig. 28

**Material examined.** 1♂, Aktash, 19-20.09.2025, S.A. Knyazev (CSKO); 2♂, Stepushka, 15-16.09.2025, S.A. Knyazev, V.V. Ivonin (CSKO, CVIN).

**Remark.** Late autumn rare and local species in Siberia. Widespread in the steppe habitats from European Part of Russia up to Far East (Kononenko 2016; Sinev 2019).

***Actebia flacca* (Corti & Draudt, 1933)**

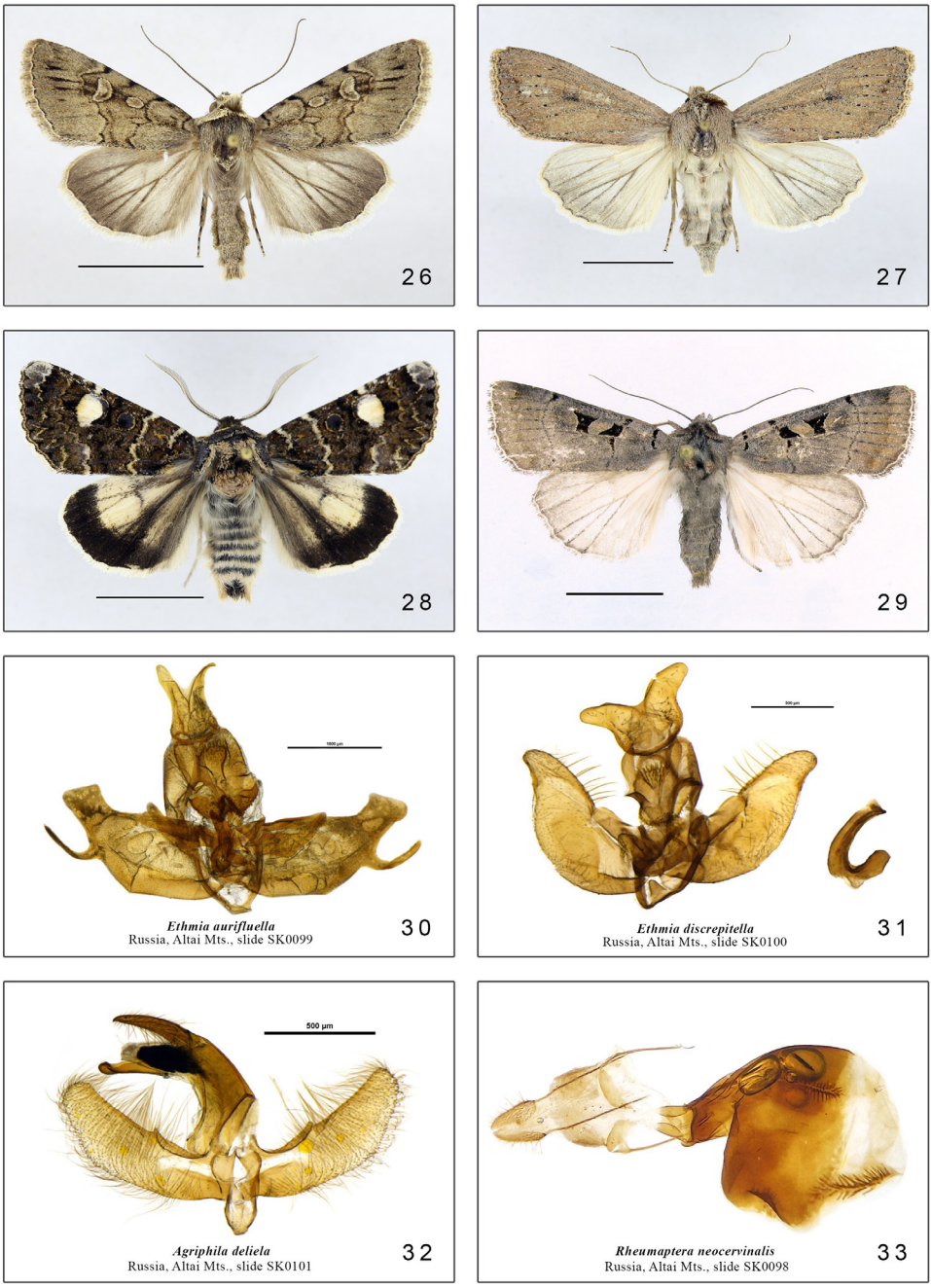
**Material examined.** 1♂, Stepushka, 15-16.09.2025, S.A. Knyazev (CSKO).

**Remark.** Rare Central Asian species known in Russia from Altai Republic only. It was reported from Chikhacheva Mt. Ridge (Volynkin 2012). New finding complement the range of the species in Altai Republic.

***Eugnorisma ignoratum* Varga & L.Ronkay, 1994**
Fig. 29

**Material examined.** 1♂, Aktash, 19-20.09.2025, V.V. Ivonin (CVIN).

**Remark.** European-Central Asian xerophilous species, distributed in Russia on South Ural and in South Siberian Mountains (Volynkin 2012; Sinev 2019). New finding complement the range of the species in Altai Republic.




**Figures 26–33.** Adult specimens of Lepidoptera, upper side: **26** – *Sympistis strioligera*, Kurai (CSKO); **27** – *Fabula zollikoferi*, Telengit-Sortogoi (CSKO); **28** – *Oxytripia orbiculosa*, Stepushka (CSKO); **29** – *Eugnorisma ignoratum*, ♂, Aktash (CVIN). Genitalia preparations: **30** – *Ethmia aurifluella*, ♂, Kurai (CSKO); **31** – *Ethmia discrepitella*, ♂, Kurai (CSKO); **32** – *Agriphila deliella*, ♂, Stepushka (CSKO); **33** – *Rheumaptera neocervinalis*, ♀, Stepushka (CSKO).

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## References

Dubatolov VV (2010) Tiger-moths of Eurasia (Lepidoptera, Arctiidae) (Nyctemerini by Rob de Vos & Vladimir V. Dubatolov). Neue Entomologische Nachrichten 65: 1–106.

Dubatolov VV, Ustjuzhanin PYa, Zintshenko VK (1997) A review of the Ethmiidae of the Asian part of Russia and neighbouring territories. Atalanta 28(1/2): 161–171.

Huemer P, Wieser C, Wiesmair B, Sinev SYu, Weiser Ch, Yakovlev RV (2017) Schmetterlinge (Lepidoptera) des Altai-Gebirges (Südsibirien, Russland) – Eindrücke einer internationalen Expedition im Spätsommer 2016. Carinthia II 207(127): 527–564.

Knyazev SA (2020) Catalogue of Lepidoptera of Omsk Oblast (Russia). Macrolepidoptera. Families: Hepialidae, Brachodidae, Cossidae, Sesiidae, Limacodidae, Zygaenidae, Thyrididae, Drepanidae, Uraniidae, Geometridae, Lasiocampidae, Lemoniidae, Endromididae, Saturniidae, Sphingidae, Notodontidae, Lymantriidae, Arctiidae, Syntomidae, Erebidae, Nolidae, Noctuidae, Hesperiidae, Papilionidae, Pieridae, Lycaenidae, Nymphalidae, Satyridae. Acta Biologica Sibirica 6: 139–226. https://doi.org/10.3897/abs.6.e53005

Knyazev SA (2022) Catalogue of Lepidoptera of Omsk Region (Russia). Microlepidoptera. Families: Eriocraniidae, Nepticulidae, Opostegidae, Adelidae, Prodoxidae, Incurvariidae, Psychidae, Tineidae, Roeslerstammiidae, Bucculatricidae, Gracillariidae, Yponomeutidae, Argyresthiidae, Plutelliidae, Acrolepiidae, Glyphipterigidae, Ypsolophidae, Lyonetiidae, Bedelliidae, Ethmiidae, Depressariidae, Elachistidae, Parametriotidae, Scythrididae, Chimabachidae, Cryptolechiidae, Oecophoridae, Batrachedridae, Coleophoridae, Momphidae, Blastobasidae, Autostichidae, Cosmopterigidae, Gelechiidae, Pterophoridae, Epermeniidae, Choreutidae, Galacticidae, Tortricidae, Pyralidae, Crambidae. Acta Biologica Sibirica 8: 17–87. https://doi.org/10.5281/zenodo.7690616

Knyazev SA (2023) New records of moths (Insecta: Lepidoptera, Heterocera) in Altai Republic. Amurian Zoological Journal 15(4): 813–823. https://www.doi.org/10.33910/2686-9519-2023-15-4-813-823 [In Russian]

Knyazev SA (2019) New Records of Heterocera (Lepidoptera) from the Republic of Tyva (Southern Siberia, Russia). Amurian Zoological Journal 11(1): 42–47. http://dx.doi.org/10.33910/1999-4079-2019-11-1-42-47 [In Russian]

Knyazev SA, Makhov IA, Matov AYu, Yakovlev RV (2020) Check-list of Macroheterocera (Insecta, Lepidoptera) collected in 2019 in Mongolia by Russian entomological expeditions. Ecologica Montenegrina 38: 186–204. http://dx.doi.org/10.37828/em.2020.38.27

Knyazev SA, Gabdullina AU, Makhov IA (2021) New data on distribution and molecular genetics of *Lignyoptera fumidaria* (Hübner, [1825]) (Lepidoptera: Geometridae). SHILAP Revista de lepidopterología 49(196): 667–672. https://doi.org/10.57065/shilap.228

Kononenko VS (2016) Noctuidae: Cuculliinae – Noctuinae, part (Lepidoptera). Noctuoidea Sibiricae. Part 3. Proceedings of the Museum Witt Munich 5: 1–500.

Lvovsky AL (2006) Check-list of the broad-winged and flat moths (Lepidoptera: Oecophoridae, Chimabachidae, Amphisbatidae, Depressariidae) of the fauna of Russia and adjacent territories. Proceedings of the Zoological Institute. Russian Academy of Sciences 307: 118 pp. [In Russian]

Lvovsky AL, Knyazev SA (2012) Microlepidoptera of Omsk Province. First report. Families Ethmiidae, Cryptolechiidae, Depressariidae, Chimabachidae, Oecophoridae, Autostichidae. Amurian Zoological Journal 4(1): 26–30. [In Russian]

Makhov IA, Beljaev EA (2019) New data on Geometrid moths (Lepidoptera: Geometridae) of the Baikal Region, Russia. Far Eastern Entomologist 391: 1–23.

Saldaitis A, Ivinskis P (2006) A new species of Hyles (Lepidoptera, Sphingidae) from Mongolia with distributional notes on the other members of the Genus. Acta Zoologica Lithuanica 16(4): 317–322.

Shovkoon DF (2008) On the rediscovery of *Ethmia discrepitella* (Rebel, 1901) with remarks on brachyptery in females of Ethmia (Ethmiidae). Nota lepidopterologica 31(2): 215–221.

Shovkoon DF, Sachkov SA (2014) To the distribution of *Ethmia discrepitella* (Rebel, 1901) (Lepidoptera, Ethmiidae). Bulletin of Samara State University 10: 174–177. [In Russian]

Sinev SYu (ed) (2019) Catalogue of Lepidoptera of Russia. Second Edition. Zoological Institute RAS, St. Petersburg, 448 pp. [In Russian]

Slamka F (2008) Pyraloidea of Europe (Lepidoptera). Vol. 2. Crambinae & Schoenobiinae. Bratislava, 223 pp.

Vasilenko SV (2001) New and little-known geometrid moths (Lepidoptera, Geometridae) from Russian Altai. Zoological Journal 80(5): 538–544. [In Russian]

Volynkin AV (2012) Noctuidae of the Russian Altai (Lepidoptera). Tigirek State Natural Reserve Publ., Barnaul, 339 pp.

Yakovlev RV, Gus`kova EV, Doroshkin VV, Titov SV (2015) Sphingidae of the Mongolian Altai (Lepidoptera, Sphingidae). SHILAP Revista Lepidopterologia 43(171): 467–478.

Zolotuhin VV (2015) Lappet moth (Lepidoptera: Lasiocampidae) of Russia and Adjacent Territories. Ulyanovsk, 384 pp. [In Russian]

Zuban IA, Knyazev SA, Suindykov BM, Lunyov VS, Shnel SV (2024) Late Autumn aspect of the Lepidoptera fauna of North Kazakhstan with the first record of *Lignyoptera fumidaria* (Hubner, 1825) on the territory of the West Siberian Plain. Acta Biologica Sibirica 10: 1371–1378. https://doi.org/10.5281/zenodo.14242289