

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

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Abstract

This article presents the results of a study of the Lepidoptera fauna in the North Kazakhstan region in the late Autumn field season of 2024. An annotated checklist includes 54 species from 14 families, including Lycaenidae, Nymphalidae, Geometridae, Lasiocampidae, Sphingidae, Erebiidae, Noctuidae, Gracillariidae, Pterophoridae, Depressariidae, Pyralidae, Crambidae, Crambinae, Tortricidae. 15 species are reported to the North Kazakhstan region for the first time, including rare and little-known late Autumn species *Lignyoptera fumidaria* (Hubner, 1825) which had not previously been recorded on the territory of the West Siberian Plain.

Keywords

Fauna, biodiversity, Gracillariidae, Depressariidae, Pterophoridae, Tortricidae, Pyralidae, Crambidae, Lycaenidae, Nymphalidae, Geometridae, *Lignyoptera fumidaria*, Lasiocampidae, Sphingidae, Erebiidae, Noctuidae, new data

Introduction

We have been working on the study of Lepidoptera in the North Kazakhstan region since 2015, when the first foundations for monitoring and systematization of the local fauna of this group of insects were published (Knyazev 2015). In recent years, we have been actively researching the species diversity of Lepidoptera, which allows us not only to expand our scientific horizons, but also to make a significant contribution to understanding biological diversity in this region. The main results of our research have been presented in a number of publications (Knyazev 2015; Knyazev and Zuban 2016; 2019; Zuban et al. 2022; Knyazev 2024). At the moment, the general list of Lepidoptera species recorded in the North Kazakhstan region includes 603 species. During late Autumn 2024 field season, in September and October, the authors carried out work on the study of Lepidoptera in the central, forest-steppe part of the region (Fig.1). The collected materials served as the basis for the preparation of this article.

Materials and methods

In the course of this study, the authors used standard methods of collecting material. The capture of butterflies was carried out with an air net, moths were caught using light traps equipped with mercury lamps of the DRV-500 type. The systematic list is given in accordance with the latest edition of the Catalog of Lepidoptera of Russia (Sinev 2019). All samples are currently kept in private collections of the authors (Petropavlovsk, Kazakhstan). A new species to North Kazakhstan marked with an asterisk (*).

The materials were collected in the following localities:

1. Ivanovka – Kyzylzharsky district, Ivanovka village, 54°39'32,07"N, 68°55'48,30"E;
2. Yasnovka – Yesilsky district, Yasnovka village, 53°58'26"N, 68°12'39"E;
3. Semipolka – Shal Akyn district, Semipolka village, 54°07'30"N, 67°16'50"E;
4. Smirnovno – Akkayinsky district, Smirnovno village, 54°30'58"N, 69°23'48"E.

Results

Species list

Gracillariidae

1. *Monopis monachella* (Hübner, 1796) – 1 specimen, Ivanovka, 13.09.2024.

Depressariidae

2. **Agonopterix arenella* (Denis & Schiffermüller, 1775) – 1 specimen, Smirnov, 27.09.2024.
3. **Agonopterix ocellana* (Fabricius, 1775) – 1 specimen, Yasnovka, 28.09.2024.
4. **Agonopterix propinquella* (Treitschke, 1835) – 1 specimen, Ivanovka, 27.09.2024.

Pterophoridae

5. *Emmelina monodactyla* (Linnaeus, 1758) – 2 specimens, Ivanovka, 13.09.2024; 2 specimens, Smirnov 14.09.2024; 1 specimen, Smirnov, 05.10.2024; 12 specimens, Ivanovka, 20.09.2024.

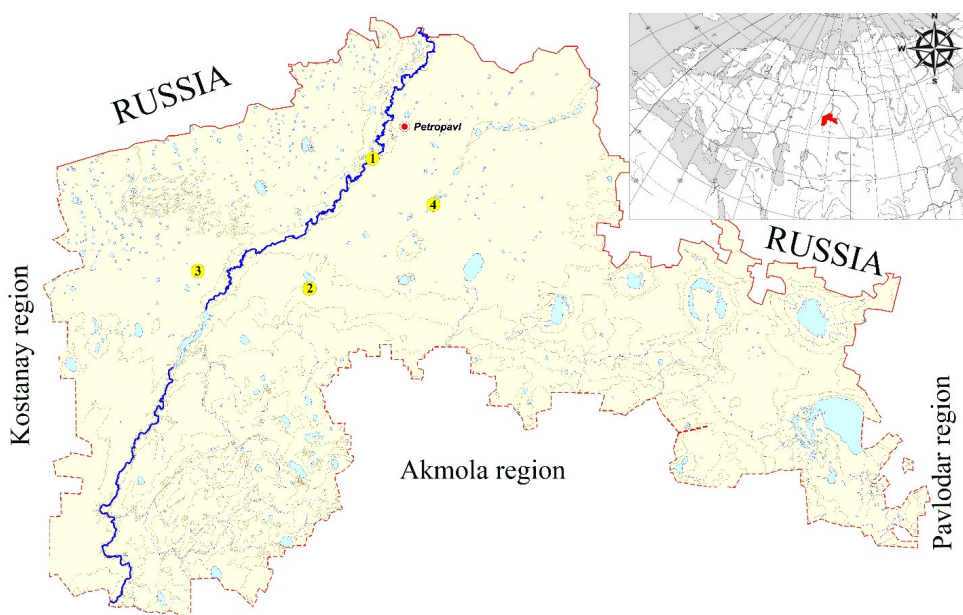


Figure 1. Localities of Lepidoptera collection in the North Kazakhstan region.

Tortricidae

6. **Acleris umbrana* (Hübner, 1799) – 1 specimen, Ivanovka, 27.09.2024.
7. *Xerocnephasia rigana* (Sodoffsky, 1829) – 1 specimen, Smirnov, 21.09.2024.

Pyralidae

8. **Hypsopygia costalis* (Fabricius, 1775) – 3 specimens, Ivanovka, 13.09.2024.

9. *Pyralis farinalis* (Linnaeus, 1758) – 1 specimen, Ivanovka, 13.09.2024.
10. **Nyctegretis lineana* (Scopoli, 1786) – 1 specimen, Ivanovka, 13.09.2024.

Crambidae

11. *Chrysoteuchia culmella* (Linnaeus, 1758) – 1 specimen, Ivanovka, 13.09.2024.

Lycaenidae

12. *Thecla betula* (Linnaeus, 1758) – 8 specimens, Ivanovka, 20.08 – 27.09.2024.

Nymphalidae

13. *Polygonia c-album* (Linnaeus, 1758) – 1 specimen, Ivanovka, 05.10.2024.
14. *Vanessa atalanta* (Linnaeus, 1758) – 5 specimens, Ivanovka, 06.09.2024.

Geometridae

15. **Lignoptera fumidaria* (Hubner, 1825) – 1♂, Smirnov, 27.09.2024 (Fig.2); 1♂, Ivanovka, 27.09.2024, at light.
16. *Ennomos autumnaria* (Werneburg, 1859) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Semipolka, 13.09.2024; 1 specimen, Yasnovka, 14.09.2024; 2 specimens, Yasnovka, 21.09.2024.
17. *Xanthorhoe fluctuata* (Linnaeus, 1758) – 1 specimen, Ivanovka, 05.10.2024.

Lasiocampidae

18. *Poecilocampa populi* (Linnaeus, 1758) – 1 specimen, Yasnovka, 21.09.2024.

Sphingidae

19. *Hyles gallii* (Rottemburg, 1775) – 1 specimen, Smirnov, 14.09.2024.

Erebidae

20. *Hypena rostralis* (Linnaeus, 1758) – 1 specimen, Ivanovka, 05.10.2024; 2 specimens, Smirnov, 21.09.2024.
21. *Catocala fraxini* (Linnaeus, 1758) – 1 specimen, Smirnov, 14.09.2024; 8 specimens, Ivanovka, 20.09.2024; 1 specimen, Yasnovka, 21.09.2024.
22. *Catocala nupta* (Linnaeus, 1767) – 1 specimen, Smirnov, 27.09.2024; 1 specimen, Semipolka, 28.09.2024.

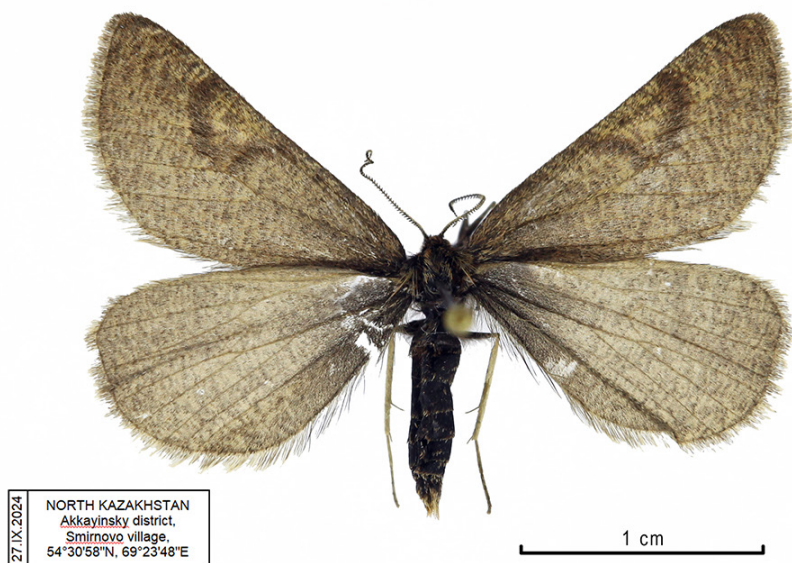


Figure 2. *Lignyoptera fumidaria* (Hubner, 1825), ♂, Smirnovo, 27.09.2024.

Noctuidae

23. *Macdunnoughia confusa* (Stephens, 1850) – 3 specimens, Ivanovka, 13.09.2024; 2 specimens, Smirnovo, 21.09.2024; 2 specimens, Yasnovka, 21.09.2024; 1 specimen, Yasnovka, 28.09.2024; 3 specimens, Semipolka, 28.09.2024.
24. *Autographa gamma* (Linnaeus, 1758) – 1 specimen, Smirnovo, 21.09.2024; 1 specimen, Yasnovka, 14.09.2024; 1 specimen, Ivanovka, 27.09.2024.
25. *Autographa mandarina* (Freyer, 1845) – 3 specimens, Ivanovka, 13.09.2024.
26. *Plusia festucae* (Linnaeus, 1758) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Semipolka, 13.09.2024; 1 specimen, Yasnovka, 14.09.2024; 1 specimen, Smirnovo 05.10.2024.
27. *Aedia funesta* (Esper, 1786) – 2 specimens, Yasnovka, 14.09.2024.
28. *Helicoverpa armigera* (Hübner, 1808) – 1 specimen, Ivanovka, 13.09.2024; 4 specimens, Ivanovka, 27.09.2024; 2 specimens, Semipolka, 28.09.2024.
29. *Caradrina albina* (Eversmann, 1848) – 2 specimens, Ivanovka, 13.09.2024; 1 specimen, Smirnovo, 14.09.2024; 1 specimen Yasnovka, 21.09.2024; 1 specimen, Smirnovo, 27.09.2024.
30. *Calamia tridens* (Hufnagel, 1766) – 1 specimen, Yasnovka, 21.09.2024.
31. **Gortyna flavago* (Denis & Schiffermüller, 1775) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Smirnovo, 13.09.2024; 5 specimens, Smirnovo, 14.09.2024; 1 specimen, Ivanovka, 20.09.2024; 8 specimens, Smirnovo, 21.09.2024; 1 specimen, Semipolka, 28.09.2024; 1 specimen, Smirnovo, 27.09.2024.

32. *Amphipoea fucosa* (Freyer, 1830) – 1 specimen, Smirnov, 14.09.2024.
33. **Rhizodra lutosa* (Hübner, 1803) – 1 specimen, Ivanovka, 13.09.2024; 4 specimens, Smirnov, 14.09.2024; 4 specimens, Smirnov, 21.09.2024; 1 specimen, Smirnov, 27.09.2024.
34. *Nonagria typhae* (Thunberg, 1784) – 2 specimens, Ivanovka, 13.09.2024; 1 specimen, Semipolka, 13.09.2024; 1 specimen, Yasnovka, 14.09.2024.
35. **Allophyes oxyacanthae* (Linnaeus, 1758) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Smirnov, 14.09.2024; 1 specimen, Ivanovka, 20.09.2024.
36. **Denticucullus pygmina* (Haworth, 1809) – 1 specimen, Smirnov, 21.09.2024.
37. *Resapamea hedeni* (Graeser, 1889) – 1 specimen, Ivanovka, 20.09.2024; 1 specimen, Semipolka, 28.09.2024.
38. *Cirrhia ictertia* (Hufnagel, 1766) – 2 specimens, Ivanovka, 13.09.2024; 2 specimens, Smirnov 14.09.2024; 1 specimen, Yasnovka, 21.09.2024; 1 specimen, Ivanovka, 27.09.2024; 1 specimen, Smirnov 28.09.2024.
39. *Cirrhia ocellaris* (Borkhausen, 1792) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Smirnov, 14.09.2024; 3 specimens, Yasnovka, 21.09.2024; 2 specimens, Yasnovka, 28.09.2024.
40. *Cirrhia tunicata* (Graeser, 1890) – 1 specimen, Smirnov 14.09.2024.
41. *Conistra rubiginea* (Denis & Schiffermüller, 1775) – 1 specimen, Ivanovka, 13.09.2024; 2 specimens, Yasnovka, 28.09.2024; 1 specimen, Semipolka, 28.09.2024; 1 specimen, Smirnov, 05.10.2024; 1 specimen, Semipolka, 28.09.2024.
42. *Conistra vaccinii* (Linnaeus, 1761) – 1 specimen, Ivanovka, 13.09.2024; 3 specimens, Smirnov 14.09.2024; 6 specimens, Yasnovka, 14.09.2024; 10 specimens Smirnov, 21.09.2024; 20 specimens, Yasnovka, 21.09.2024; 11 specimens, Smirnov 27.09.2024, 20 specimens, Yasnovka, 28.09.2024; 5 specimens, Semipolka, 28.09.2024; 9 specimens, Smirnov, 5.10.2024.
43. **Lithophane socia* (Hufnagel, 1766) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Yasnovka, 14.09.2024.
44. *Xylena vetusta* (Hübner, 1813) – 1 specimen, Smirnov, 27.09.2024; 2 specimens, Ivanovka, 13.09.2024.
45. **Eupsilia transversa* (Hufnagel, 1766) – 2 specimens Yasnovka, 28.09.2024.
46. *Ammoconia caecimacula* (Denis & Schiffermüller, 1775) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Smirnov, 14.09.2024; 1 specimen, Ivanovka, 20.09.2024.
47. **Dasypolia templi* (Thunberg, 1792) – 1 specimen Yasnovka, 28.09.2024.
48. **Blepharita amica* (Treitschke, 1825) – 1 specimen, Semipolka, 13.09.2024; 2 specimens, Yasnovka, 14.09.2024.
49. *Mniotype satura* (Denis & Schiffermüller, 1775) – 1 specimen, Semipolka, 13.09.2024; 1 specimen, Ivanovka, 27.09.2024.
50. *Anarta trifolii* (Hufnagel, 1766) – 2 specimens, Ivanovka, 13.09.2024; 2 specimens, Smirnov 14.09.2024; 1 specimen, Smirnov, 27.09.2024; 1 specimen, Ivanovka, 27.09.2024.

51. *Lacanobia suasa* (Denis & Schiffermüller, 1775) – 1 specimen, Ivanovka, 20.09.2024; 1 specimen, Ivanovka, 27.09.2024; 2 specimens, Semipolka, 28.09.2024.
52. *Eurois occulta* (Linnaeus, 1758) – 1 specimen, Ivanovka, 20.09.2024.
53. *Xestia c-nigrum* (Linnaeus, 1758) – 1 specimen, Ivanovka, 13.09.2024; 1 specimen, Yasnovka, 14.09.2024; 1 specimen, Yasnovka, 14.09.2024; 1 specimen Yasnovka, 21.09.2024; 2 specimens, Smirnov, 05.10.2024.
54. *Xestia ditrapezium* (Denis & Schiffermüller, 1775) – 1 specimen, Smirnov, 21.09.2024; 1 specimen, Yasnovka 28.09.2024.

Conclusion

The find of *Lignyoptera fumidaria* is of the greatest interest. It was mentioned that the range of this species extends from Europe to the Southern Urals, and then, after a large gap, local populations occur in the Altai Mountains in southern Siberia, Russia and Eastern Kazakhstan (Knyazev et al. 2021). We have suggested the possible presence of *L. fumidaria* in the steppes between the Southern Urals and Altai (Knyazev et al. 2021). The present findings confirm this assumption and indicate a wide distribution of the species in the steppe zone of southern Western Siberia. Based on the new findings of the species in Northern Kazakhstan, it is possible to expect the occurrence of this species in other neighboring steppe regions, such as the south of the Kurgan, Omsk and Novosibirsk regions, Altai Territory (Russia), Kostanay and Pavlodar regions (Kazakhstan).

Thus, the list of Lepidoptera of the North Kazakhstan region has been significantly expanded by adding 15 new species. As a result, the total number of Lepidoptera species known in the North Kazakhstan region has reached 618.

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