

# Lepidoptera of South Ossetia (Northern Transcaucasia). Part I. Introduction and Superfamily Pyraloidea Latreille, 1809

Aleksandr N. Streltsov

Herzen State Pedagogical University of Russia, 48 Moika Emb., Saint Petersburg 191186, Russia

Petr Ya. Ustjuzhanin

Altai State University, 61 Lenina Ave., Barnaul 656049, Russia; Biological Institute, Tomsk State University, 36 Lenina Ave., Tomsk 634050, Russia;  
<https://orcid.org/0000-0002-5222-2241>

Roman V. Yakovlev

Altai State University, 61 Lenina Ave., Barnaul 656049, Russia; Biological Institute, Tomsk State University, 36 Lenina Ave., Tomsk 634050, Russia;  
<https://orcid.org/0000-0001-9512-8709>

In the first part of the publication, we present the faunal list of Pyraloidea of South Ossetia, including 111 species of 64 genera, belonging to two families. For the first time, 96 species are reported for South Ossetia. *Scoparia manifestella* (Herrich-Schäffer, 1848) and *Scoparia perplexella* (Zeller, 1839) are found in the Caucasus for the first time, and the new species *Scoparia sinevi* Streltsov, 2022 is currently indicated as an endemic of South Ossetia.

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Corresponding author: Aleksandr N. Streltsov ([streltsov@mail.ru](mailto:streltsov@mail.ru))

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## Keywords

Biodiversity, Caucasus, species richness, fauna, Pyralidae, Crambidae

## Introduction

South Ossetia (Fig. 1) is a compact region in Northern Transcaucasia, located at the southern slope of the Central Caucasus at the foothills of the Inner Kartli Plain. Almost 90 % of the territory of the republic is located at the altitudes higher than 1000 m above sea level. The highest point of South

Ossetia is mountain Khalatsa (3938 m). The mountainous portion of the republic is presented by the Dvaletskiy ridge on the border with Russia and the transverse ridges - Rachinsky, Likhsky, Kesheltsky, Mashkharsky, Dzausky, Gudissky, Kharulsky, Lomissky and Mtiuleti. The foothill area is located in the extreme south of the region, where the valleys of the rivers Prone, Greater and Lesser Liakhva, Mejuda and Ksan go to the northern outskirts of the Inner Kartli Plain.



**Figure 1.** South Ossetia on the map of Caucasus

The climate of South Ossetia changes with the altitude from the moderately dry and warm, with a cool winter and hot summer (in the south-eastern part) to the humid, with a cold long winter and a cool summer at 2000 m, and to the humid and cold during all the year at 3000 m (in the north). The average temperature of January is  $-1^{\circ}\text{C}$  in Tskhinvali (867 m), at 2000 m - from  $-3$  to  $-8^{\circ}\text{C}$ , higher - from  $-12$  to  $-14^{\circ}\text{C}$ , and of July -  $20,6^{\circ}\text{C}$ ,  $8-13^{\circ}\text{C}$ ,  $4-2^{\circ}\text{C}$  respectively. The annual amount of precipitation goes up from 600 mm on the plain to 1000–1800 mm in the highlands. The snow border lies at 3200–3300 m. The current glaciation is minor, the largest glacier, Lagzzigi, has a area about 1,8 km<sup>2</sup>.

At the foothills, the secondary shrub steppes are common, with *Rosa* L., *Crataegus* Tourn. Ex L. (Rosaceae), and *Paliurus spina-christi* Mill. (Rhamnaceae) on the site of cut forests. In the extreme south, there are portions of Phrygana. In the valleys, there are trees and shrubs on the alluvial soils. Trees and shrubs take about half of the territory. In the lower belt of the forest (600–700 m a.s.l.) the predominating are *Quercus* and *Quercus-Caprinus* forests with shrubs (*Mesmilus* L. (Rosaceae), *Cornus* L. (Cornaceae), and *Berberis* L. (Berberidaceae)) and fruit trees (*Malussyl-vestris* (L.) Mill., *Pyrus communis* L., and *Prunus avium* (L.) L. (Rosaceae)). At the altitude

of 1000–1100 m, they are replaced by *Fagus* L. forests with *Caprinus* L. (Betulaceae) and *Acer* L. (Sapindaceae). Higher than 1500–1600 m, there are mixed *Fagus-Picea* forests, interspersed with *Picea* Forests, in some places with *Abies* Mill. and *Pinus* L. (Pinaceae). In the west forests, some Colchisian elements are found (in the evergreen under-bush – *Prunus laurocerasus* L. (Rosaceae), *Ilex* L. (Aquafoliaceae), *Ruscus* Tour. & L.); the epiphytes are numerous. In gorges, *Taxus baccata* L. (Taxaceae) is preserved in some places. At the upper border of the forests, the crooked woods of *Fegos* L. (Fagaceae), *Acer trautvetteri* Medw. (Sapindaceae), and *Betula raddeana* Trautv. (Betulaceae) are often found; beech accounts for about 80% of the total forested area. Higher than 2200–2350 m there are sub-alpine (with *Rhododendron caucasicum* Pall. (Ericaceae) and alpine meadows (Dzagoev 2003).

The faunal diversity of South Ossetia is very poorly studied. Only two articles on the spider and amphibian fauna completely illustrate the richness of the animal world of South Ossetia (Ponomarev and Komarov 2015; Tuniev et al. 2017). The information on the rare and endangered species of flora and fauna of South Ossetia is provided in the beautifully published Red Book (Bazaev et al. 2017). The articles on the Lepidoptera fauna are rather fragmentary (Pospelov et al. 1986; Pukhaev et al. 1987; Pukhaev and Pukhaeva 1989, 1991; Pukhaeva 1995; Didmanidze 2004; Komarov 2013; Dobronosov and Komarov 2014, 2015).

This series of articles is devoted to the Lepidoptera fauna of South Ossetia. The superfamily Pyraloidea Latreille, 1809 of South Ossetia are practically not studied. In the single article on this theme, they give data on the distribution of 15 Pyraloidea species (Dobronosov and Komarov 2014), collected on the territory and environs of Tskhinval and Atriskhev cities. The authors report the following for this region: *Agriphila straminea* (Denis & Schiffermüller, 1775), *Chilo phragmitella* (Hübner, 1805), *Chrysocrambus craterellus* (Scopoli, 1763), *Evergestis frumentalis* (Linnaeus, 1761), *Cynaedentalis* (Denis & Schiffermüller, 1775), *Loxostege sticticalis* (Linnaeus, 1761), *Scoparia subfusca* Haworth, 1811, *Diasemia reticularis* (Linnaeus, 1761), *Nomophila noctuella* (Denis & Schiffermüller, 1775), *Paratalanta pandalis* (Hübner, 1825), *Aphomia sociella* (Linnaeus, 1758), *Endotricha flamealis* (Denis & Schiffermüller, 1775), *Pyralis farinalis* (Linnaeus, 1758), and *Selagia argyrella* (Denis & Schiffermüller, 1775).

Additionally, Dobronosov (2017) and Tuniyev et al. (2018) reported the important invasive species *Cydalima perspectalis* (Walker, 1859) for the village of Nagutni of Znaur district, and for the balneary "Nyfs" of South Ossetia. This species is widely distributed in the Eastern Palaearctic (Streltsov 2008) and also found in Russian Far East (Kirpichnikova 2005). In XXI, it penetrated to Europe (Kruger 2008). From Italy it was introduced to the Caucasus and then spread all over the Caucasian region (Shchurov et al. 2015; Dobronosov 2017; Tuniyev et al. 2018; Ustjuzhanin et al. 2022).

The new species of Crambidae, *Scoparia sinevi* Streltsov, 2022 was described by us (Streltsov et al. 2022) from Rachinsky ridge in the north-west of South Ossetia.

## Material and methods

The specimens were collected in South Ossetia in seven localities. The list of collection sites was chosen by Alexandr Fomichev, Barnaul, for the most complete overview of the altitudinal belts and plant communities of South Ossetia.

The collections were carried out by manual collection during the daytime and at dusk, as well as on light screens Naturaliste-150 and Naturaliste-180 (using lamps OSRAM-160, 250 W), powered by the inverter generator Honda EU10i (Fig. 2) and autonomous light traps ENTOSPHINX lamp UV LED 12 V/19,2W (equipped with diodes 240 UV LED) (Fig. 3). Deadening of the specimens was carried out using ethyl acetate. The material was mounted on entomological pins.



**Figure 2.** Light screens *Naturaliste-180* (photo by R. Yakovlev)



**Figure 3.** *Autonomous light traps (photo by A. Fomichev)*

**The examined material is kept in the collections:**

ASSP collection of Alexandr Streltsov (Saint-Petersburg, Russia);

CUK collection of Petr Ustjuzhanin and Vasiliy Kovtunovich (Novosibirsk, Moscow, Russia);

PMM collection of Pavel Morozov (Moscow, Russia);

RMBH Russian Museum of Biodiversity Hotspots, N. Laverov Federal Center for Integrated Arctic Research of the Ural Branch of the Russian Academy of Sciences (Arkhangelsk, Russia);

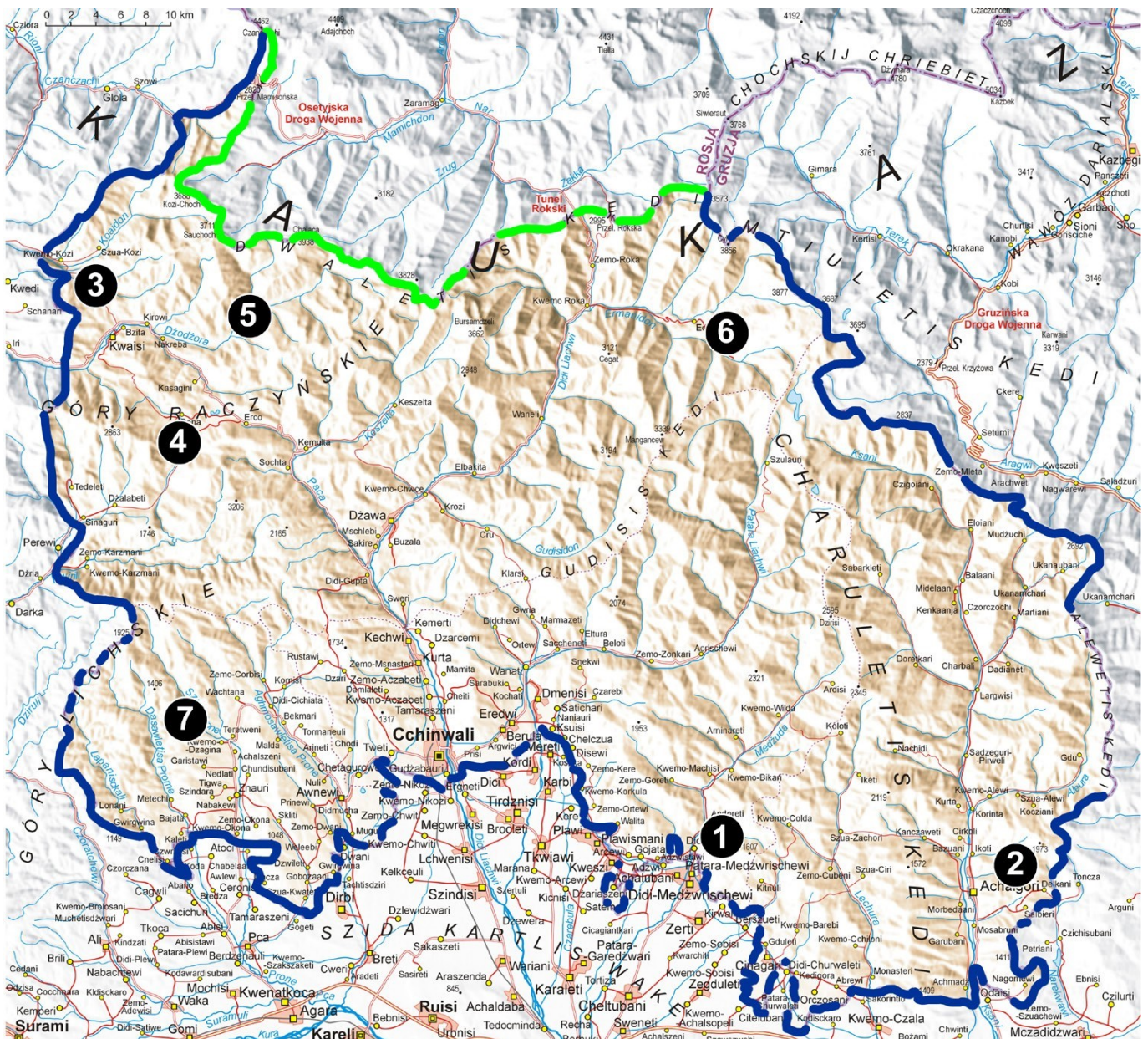
RYB collection of Roman Yakovlev (Barnaul, Russia);

ZISP Zoological Institute of the Russian Academy of Sciences (Saint-Petersburg, Russia).

**List of collecting localities (Fig. 4)**

1. South Ossetia, Tskhinval Distr., 2 km NW Grom, 42°10'6"N / 44°11'53"E, 930 m, 22–25.06.2021, A. Streltsov, P. Ustjuzhanin & R. Yakovlev leg. (Fig. 5);

2. South Ossetia, Leningor Distr., 4 km E Leningor, 42°08'45"N, 44°30'55"E / 1200 m, 26–27.06.2021, A. Streltzov, P. Ustjuzhanin & R. Yakovlev leg. (Fig. 6);
3. South Ossetia, Dzaus Distr., 4 km NNE Kvaisa, Koz lake, 42°33'32"N / 43°37'59"E, 1580 m, 28–30.06.2021, A. Streltzov, P. Ustjuzhanin & R. Yakovlev leg. (Fig. 7);
4. South Ossetia, Dzaus Distr., Rachinsky Range, near Dodtota, 42°27'25"N / 43°43'18"E, 1750 m, 1–2.07.2021, A. Streltzov, P. Ustjuzhanin & R. Yakovlev leg. (Fig. 8);
5. South Ossetia, Dzaus Distr., Dvalet Range, near Kherusel't, 42°32'37"N / 43°47'32"E, 1760 m, 3–5.07.2021, A. Streltzov, P. Ustjuzhanin & R. Yakovlev leg. (Fig. 9);
6. South Ossetia, Dzaus Distr., Mtiulet Range, near Erman, 42°31'2"N / 44°14'10"E, 2140 m, 7–9.07.2021, P. Ustjuzhanin & R. Yakovlev leg. (Fig. 10);
7. South Ossetia, Znaur Distr., 2 km W Dzagina, 42°14'34"N / 43°43'11"E, 1100 m, 11–12.07.2021, P. Ustjuzhanin & R. Yakovlev leg. (Fig. 11).



**Figure 4.** Map of South Ossetia with collecting localities



**Figure 5.** Tskhinval Distr., 2 km NW Grom, 42°10'6"N / 44°11'53"E (photo by R. Yakovlev)



**Figure 6.** Leningor Distr., 4 km E Leningor, 42°08'45"N, 44°30'55"E (photo by R. Yakovlev)





**Figure 7.** *Dzaus Distr.*, 4 km NNE *Kvaisa*, *Koz lake*, 42°33'32"N / 43°37'59"E (photo by R. Yakovlev)



**Figure 8.** *Dzaus Distr., Rachinsky Range, near Dodtota, 42°27'25"N / 43°43'18"E* (photo by R. Yakovlev)



**Figure 9.** *Dzaus Distr., Dvalet Range, near Kherusel't, 42°32'37"N / 43°47'32"E (photo by R. Yakovlev)*



**Figure 10.** *Dzaus Distr., Mtiulet Range, near Erman, 42°31'2"N / 44°14'10"E (photo by R. Yakovlev)*



**Figure 11.** Znaur Distr., 2 km W Dzagina, 42°14'34"N / 43°43'11"E (photo by R. Yakovlev)

## Results

#	Taxa	Localities						
		1	2	3	4	5	6	7
PYRALIDAE								
1	<i>Aphomia sociella</i> (Linnaeus, 1758)	-	-	-	+	-	-	-
2	<i>Endotricha flammealis</i> ([Denis & Schiffermüller], 1775)	+	+	-	-	-	-	+
3	<i>Synaphe antennalis</i> (Fabricius, 1794)	+	-	-	-	-	-	-
4	<i>Hypsopygia glaucinalis</i>	+	+	-	-	-	-	-

	s (Linnaeus, 1758)							
5	<i>Pyralis fari nalis</i> (Linnaeus, 1758)	-	+	-	-	-	-	-
6	<i>Pyralis</i> (Christoph, 1893)	-	-	-	-	-	-	+
7	<i>Elegia similella</i> (Zincken, 1818)	+	+	-	-	-	-	+
8	<i>Pempeliella ornatella</i> ([Denis & Schiffermüller], 1775)	-	+	+	+	-	-	-
9	<i>Delplanqueia inscriptella</i> (Duponchel, 1836)	-	+	-	-	+	-	-
10	<i>Catastia marginea</i> ([Denis & Schiffermüller], 1775)	-	-	+	-	-	-	-
11	<i>Sciota rhennella</i> (Zincken, 1818)	-	-	-	-	-	-	+
12	<i>Psorosa nucleolella</i> (Möschler, 1866)	+	+	-	-	-	-	-
13	<i>Selagia argyrella</i> ([Denis & Schiffermüller], 1775)	-	+	-	-	-	-	-
14	<i>Selagia spadicella</i> (Hübner, 1796)	-	+	-	-	-	-	+
15	<i>Etiella zinckella</i> (Treitschke, 1832)	-	+	-	-	-	-	-
16		+	-	-	-	-	-	-

	<i>Merulempist a cingillella</i> (Zeller, 1846)							
17	<i>Oncocera</i>  (Scopoli, 1763)	+	+	+	+	-	-	+
18	<i>Laodamia faecella</i> (Zeller, 1839)	-	-	-	-	+	-	-
19	<i>Pempelia alb ariell a</i> (Zeller, 1839)	-	+	-	-	-	-	-
20	<i>Pempelia p al umb ella</i> ([Denis & Schifferr üller], 1775)	-	+	-	-	-	-	-
21	<i>Moitreli a obductella</i> (Zeller, 1839)	-	-	-	-	-	-	+
22	<i>Rhodophaea for mosa</i> (Haworth, 1811)	+	-	-	-	-	-	-
23	<i>Dioryctria abietella</i> ([Denis & Sc hifferrmüller] , 1775)	-	-	+	+	-	-	+
24	<i>Phycita roborella</i> ([Denis & Sc hifferrmüller] , 1775)	-	+	-	-	-	-	+
25	<i>Hypochoalcia ahenella</i> ([Denis & Sc hifferrmüller] , 1775)	-	-	-	+	+	-	-
26	<i>Hypochoalcia subrubiginel la</i> (Ragonot, 1887)	-	+	-	-	+	-	-
27	<i>Nephopterix a ng ustell a</i> (Hübner, 1796)	+	+	-	-	-	-	-
28	<i>Acrobasis advenella</i> (Zincken, 1818)	-	+	-	-	-	-	+
29	<i>Acrobasis</i>	-	+	-	-	-	-	-

	<i>c on soci ella</i> (Hübner, 1813)							
30	<i>Acrobasis obtusella</i> (Hübner, 1796)	-	+	-	-	-	-	+
31	<i>Acrobasis sua vella</i> (Zincken, 1818)	-	+	-	-	-	-	+
32	<i>Acrobasis tumidana</i> ([Denis & Sc hifferrmüller] , 1775)	-	+	-	-	-	-	+
33	<i>Eccopisa effractella</i> (Zeller, 1848 )	+	-	-	-	-	-	-
34	<i>Episcythrasti s tabidella</i> (Mann, 1864)	+	-	-	-	-	-	-
35	<i>Eurhodope rosell a</i> (Scopoli, 1763)	+	+	-	-	-	-	+
36	<i>Euzophera bigella</i> (Zeller, 1848)	+	+	-	-	-	-	-
37	<i>Euzophera</i>  (Heinemann, 1865)	+	+	+	-	-	-	-
38	<i>Nyctegretis linea na</i> (Scopoli, 1786)	+	-	-	-	-	-	-
39	<i>Homoeosom a nebulella</i> ([Denis & Sc hifferrmüller] , 1775)	+	-	-	-	-	-	-
40	<i>Homoeosom a sinu ella</i> (Fabricius, 1794)	+	+	-	-	-	-	+
41	<i>Phycitodes i n qu inate</i>	-	-	-	-	-	-	+



	<i>lla</i> (Ragonot, 1887)							
42	<i>Phycitodes nigrilimbella</i> (Ragonot, 1887)	-	-	-	+	-	-	+
43	<i>Phycitodes saxicola</i> (Vaughan, 1870)	-	+	-	-	-	-	+
44	<i>Ephestia elute lla</i> (Hübner, 1796)	+	+	-	-	-	-	+
45	<i>Cadra furcat ella</i> (Herrich-Schäffer, 1849)	+	+	-	-	-	-	+
CRAMBIDAE								
46	<i>Euchromius bella</i> (Hübner, 1796)	-	-	-	-	-	-	+
47	<i>Euchromius ocella</i> (Haworth, 1811)	-	+	-	-	-	-	-
48	<i>Euchromius superbellus</i> (Zeller, 1849)	+	-	-	-	-	-	-
49	<i>Chrysoteuchia culmella</i> (Linnaeus, 1758)	+	+	+	+	+	-	+
50	<i>Crambus lathoniellus</i> (Zincken, 1817)	-	-	-	+	-	-	-
51	<i>Crambus pascuellus</i> (Linnaeus, 1758)	+	+	+	+	+	-	+
52	<i>Crambus perllella</i> (Scopoli, 1763)	-	-	-	+	-	-	-
53	<i>Agriphila stramineella</i> (Denis & Schifferm	-	-	-	-	+	-	-

	üller], 1775)							
54	<i>Catoptria</i>  (Lederer, 1870)	+	+	-	-	-	-	-
55	<i>Catoptria confusella</i> (Staudinger, 1881)	-	-	-	+	+	-	-
56	<i>Catoptria laevigatellus</i> (Lederer, 1870)	-	+	-	+	+	+	-
57	<i>Catoptria pinella</i> (Linnaeus, 1758)	-	+	-	-	-	-	+
58	<i>Catoptria verellus</i> (Zincken, 1817)	-	-	+	-	-	-	-
59	<i>Metacrambus carectellus</i> (Zeller, 1847)	-	-	-	-	-	-	+
60	<i>Chrysocrambus carterellus</i> (Scopoli, 1763)	+	-	-	-	-	-	-
61	<i>Chrysocrambus linetellus</i> (Fabricius, 1781)	+	+	-	-	-	-	+
62	<i>Thisanotia chrysonuchella</i> (Scopoli, 1763)	+	-	-	-	-	-	-
63	<i>Pediasia contaminella</i> (Hübner, 1796)	-	+	-	+	-	-	-
64	<i>Platytes cerussella</i> ([Denis & Schiffermüller], 1775)	+	+	-	-	-	-	-
65	<i>Scoparia</i>  (Herrich-Schäffer, 1848)	+	-	-	-	-	-	-
66	<i>Scoparia perplexella</i>	+	-	-	-	-	-	-

	(Zeller, 1839)							
67	<i>Scoparia in grata</i> (Zeller, 1846)	+	+	-	+	+	-	-
68	<i>Scoparia sinevi</i> (Streltsov, 2022)		-	-	+	-	-	-
69	<i>Eudonia lacustrata</i> (Panzer, 1804)	+	+	-	-	-	-	-
70	<i>Eudonia murana</i> (Curtis, 1827)	+	+	-	-	-	-	-
71	<i>Eudonia</i> (Stainton, 1849)	+	+	-	-	-	-	-
72	<i>Cynaedentalis</i> ([Denis & Schiffermüller], 1775)	+	+	-	-	-	-	+
73	<i>Ephelis cruentalis</i> (Geyer, 1832)	-	-	-	-	-	-	+
74	<i>Evergestis forficalis</i> (Linnaeus, 1758)	-	-	+	-	-	-	-
75	<i>Hellulundalis</i> (Fabricius, 1781)	+	-	-	-	-	-	-
76	<i>Loxostege sticticalis</i> (Linnaeus, 1761)	+	+	-	-	-	-	-
77	<i>Paratalanta cultralis</i> (Staudinger, 1867)	-	-	-	-	-	-	+
78	<i>Paratalanta hyalinalis</i> (Hübner, 1796)	+	+	-	+	+	-	+
79	<i>Pyrausta aurata</i> (Scopoli, 1763)	-	+	-	-	-	-	+
80	<i>Pyrausta cingulata</i> (Linnaeus, 1758)	+	+	-	-	-	-	+

81	<i>Pyrausta despicata</i> (Scopoli, 1763)	+	+	+	-	+	-	+
82	<i>Pyrausta ost rinali s</i> (Hübner, 1796)	+	+	-	-	+	-	+
83	<i>Pyrausta rectefasciali s</i> (Toll, 1936)	+	+	-	-	-	-	+
84	<i>Pyrausta aere alis</i> (Hübner, 1793)	+	+	-	+	+	-	-
85	<i>Sitochroa pale alis</i> ([Denis & Schifferm üller], 1775)	+	-	-	-	-	-	-
86	<i>Sitochroa ver ticalis</i> (Linnaeus, 1758)	+	-	-	+	-	-	+
87	<i>Psammotis pulveralis</i> (Hübner, 1796)	+	+	-	-	-	-	-
88	<i>Anania cor onata</i> (Hufnagel, 1767)	-	+	+	+	-	-	-
89	<i>Anania cro cealis</i> (Hübner, 1796)	+	+	+	+	+	-	-
90	<i>Anania fun ebris</i> (Ström, 1768)	-	+	+	-	-	-	-
91	<i>Anania lan cealis</i> ([Denis & Sc hiffermüller] , 1775)	-	+	+	-	-	-	-
92	<i>Anania s ta chy dalis</i> (Germar, 1821)	-	+	+	+	-	-	-
93	<i>Anania v er basc alis</i> ([Denis & Schifferm üller], 1775)	+	-	-	-	-	-	+

94	<i>Anania hortulata</i> (Linnaeus, 1758)	+	+	+	-	-	-	-
95	<i>Anania fuscalis</i> ([Denis & Schiffermüller], 1775)	-	+	+	+	+	-	-
96	<i>Patania ruralis</i> (Scopoli, 1763)	-	-	-	-	-	-	+
97	<i>Mecyna flavalis</i> ([Denis & Schiffermüller], 1775)	+	+	-	-	-	-	-
98	<i>Mecyna trinalis</i> ([Denis & Schiffermüller], 1775)	+	-	-	-	-	-	-
99	<i>Udea</i>  (Herrich-Schäffer, 1851)	-	-	-	+	+	-	-
100	<i>Udea lutealis</i> (Hübner, 1809)	-	-	-	-	+	-	-
101	<i>Udea olivalis</i> ([Denis & Schiffermüller], 1775)	-	-	+	+	+	-	-
102	<i>Udea vastalis</i> (Christoph, 1887)	+	-	-	-	-	-	-
103	<i>Nomophila noctuella</i> ([Denis & Schiffermüller], 1775)	+	+	+	-	-	-	-
104	<i>Agrotera nemoralis</i> (Scopoli, 1763)	+	-	-	-	-	-	-
105	<i>Cydalima</i>  (Walker, 1859)	+	-	-	-	-	-	-
106	<i>Dolicharthria punctalis</i> ([Denis & Schiffermüller])	+	-	-	-	-	-	-

, 1775)

**Table 1.** Distribution of Pyraloidea of South Ossetia

## Discussion

Most of the found species are new for the fauna of South Ossetia. Only five of the species known before (Dobronosov and Komarov 2014) are absent in our collection – *Chilo phragmitella* (Hübner, 1805), *Evergestis frumentalis* (Linnaeus, 1761), *Scoparia subfusca* Haworth, 1811, *Diasemia reticularis* (Linnaeus, 1761), *Paratalanta pandalis* (Hübner, 1825). Thus, the known fauna of Pyraloidea of South Ossetia includes 111 species of 2 families and 64 genera. In the species composition, Pyraloidea of South Ossetia are very close to the fauna of the Northern Caucasus (Sinev and Streltsov 2019; Sinev et al. 2019; Ustjuzhanin et al. 2022; Yakovlev et al. 2022), however, there is a Transcaucasian specificity, for example *Phycitodes inquinatella* (Ragonot, 1887), *Phycitodes nigrilimbella* (Ragonot, 1887), *Catoptria confusella* (Staudinger, 1881) and *Udea vastalis* (Christoph, 1887) are not found in Russia and accordingly, in the Northern Caucasus. Such species as *Scoparia manifestella* (Herrich-Schäffer, 1848) and *Scoparia perplexella* (Zeller, 1839) were found in the Caucasus for the first time, and the new species *Scoparia sinevi* (Streltsov, 2022) can currently be considered an endemic of South Ossetia.

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