

Polia lamuta (Herz, 1903) (Lepidoptera, Noctuidae) discovered in Norway, and notes on other boreo-montane species

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A single male of *Polia lamuta* (Herz, 1903) was found on the Iškoras mountain in Karasjok, Troms og Finnmark on 15–19 July 2020 with a bait trap. The discovery was expected since the species occurs widely in Northern Finland close to the Norwegian border and in the northernmost Sweden as well. The species lives in sandy, dry and sunny habitats and belongs to the boreal Palearctic continental fauna. Its taxonomy, morphology, ecology, and behavior are briefly reviewed. Occurrence of other boreal Noctuids such as *Polia vesperugo* Eversmann, 1856 and *Xestia gelida* (Sparre-Schneider, 1883) in the region is discussed.

Key words: Lepidoptera, Noctuidae, *Polia lamuta*, Iškoras, new record.

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Introduction

In most summers in the past decade the author has spent extensive time studying Lepidoptera in Russia, first in Karelia and Archangelsk and then in Buryatia and Transbaikalia in Eastern Siberia (Saarenmaa et al. 2016). The motivation is that in the core area of the distribution of the Siberian species, where they can be observed daily in numbers, one can quickly learn much of their ecology and behavior. This is difficult in Fennoscandia where these species are at the far end of their range, are rare, and only seldom can be observed. For instance, the immature stages of *Xestia brunneopicta* (Matsumura, 1925) were described as a result of our 2013 expedition (Ahola et al. 2015). We now are readying an article of *Arctia menetriesii* (Eversmann, 1846) (Tähtinen et al., in prep.).

In the summer 2020, the planned trip to Russia had to be cancelled which opened an opportunity to work again in Lapland. The question was

raised which meaningful discoveries could be made which would benefit from our experiences in Siberia, and are there any white spots on the map that could be filled?

From the mountains in Karigasniemi (Utsjoki, Finland) we have often viewed the massive Iškoras mountain (height 644 m a.s.l.) on the Norwegian side of the Tana river (Troms og Finnmark province, Karasjok municipality) and wondered what Lepidoptera could be collected there. Search on the Artsdatabanken (2020) system did not reveal much – maybe the place has not been visited systematically.

We reasoned that the Iškoras mountain might house some rare boreal continental species such as *Polia lamuta* (Herz, 1903) and *Polia vesperugo* Eversmann, 1856, which have been reported from Karigasniemi area in Finland but had not yet been found across the river in Norway (cf. Aarvik et al. 2017) (cf. Figure 1).

As a side note, it should be stated that the latter-mentioned species *Polia vesperugo* was until the

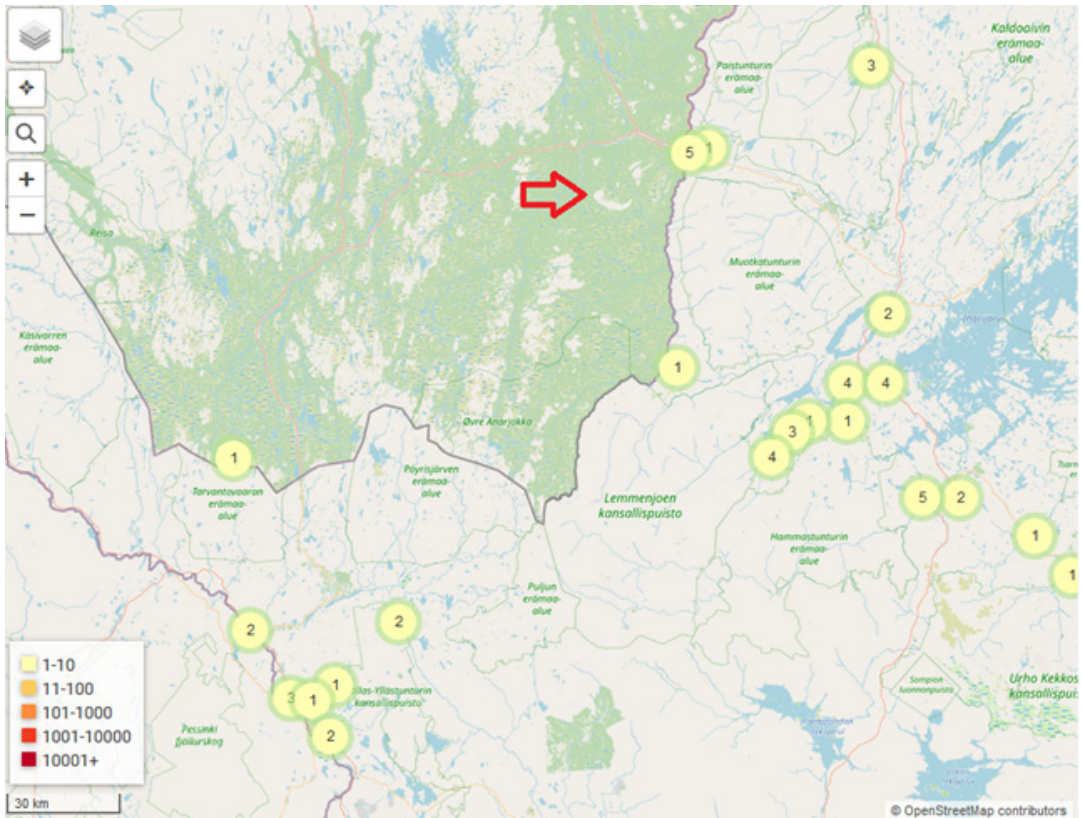


FIGURE 1. Map of *Polia lamuta* (Herz, 1903) records from FinBIF Portal (2020). The Iškoras mountain is shown with a red arrow.

recent revision of Varga et al. (2017), known by the synonym *Polia conspicua* (A. Bang-Haas, 1912). The species was for the first time detected in Finland at the Saariselkä mountain range in 1980 and at that time, lacking to access to Russian collections, was believed to be a species new to the science. It was given the name *Polia sabmeana* Mikkola, 1982. Since then older specimens have been picked up from collections and it has become obvious that this large and distinct species had been present in Lapland all of the time but had been mixed with another, remotely related species *Apamea kuusamoensis* (Aro, 1900). So, we had large white spots on the map and right in the front of our view.

According to our experiences in Finland and in Siberia, these and other boreal Noctuid species can with proper techniques be found using trapping and by systematic search in their potential resting

places. So, an expedition to the Iškoras mountain had to be made.

Material and methods

On 15 July 2020, the author placed 8 bait traps in pairs at 4 different altitudes (290 m, 320 m, 400 m, and 470 m a.s.l.) near the road that leads to the top of the Iškoras mountain. When the traps were removed on 19 July 2020, one worn-out male *Polia lamuta* specimen was found in a beer-based trap at the lowermost altitude. Geographic coordinates (WGS84) are N69.34723, E025.19981, and accuracy 10 m. Weather during this period was sunny in the beginning but became rainy towards the end. Accumulation of the thermal sum in 2020 was slow which must be taken into account when considering the phenology of the species.



FIGURE 2. The specimen of *Polia lamuta* (Herz, 1903) from the Iškoras mountain at Karasjok, Finnmark, Norway 15–19 July 2020. The specimen has been deposited in the collection of the Arctic University Museum of Norway, University of Troms, under the accession number TSZL-023768.

On 28 July 2020, ten bait traps were placed at the 400 m location by Kari Tahvanainen and Jukka Tiittanen. These traps were removed a month later, on 28 August 2020 by Jukka Tiittanen and the author. Trapping only at this altitude was chosen to aim at *Polia vesperugo*, but none was found.

Our *Polia lamuta* specimen is illustrated in Figure 2. It has been deposited in the Arctic University Museum of Norway, University of Tromsø, and its accession number is TSZL-023768.

A list of all Lepidoptera species which were observed and could be identified is given in Table 1. Noteworthy is *Xestia gelida* (Sparre-Schneider, 1883) of which a male specimen arrived in the beer-based trap at the lowermost altitude. After the holotype specimen was found in Sør-Varanger in 1882 (see Aarvik & Christiansen 2011), this is the only other record of the species in Troms og Finnmark.

The bait traps (Figure 3) which were used are



FIGURE 3. Jukka Tiittanen pictured on 28 August 2020, holding two bait traps at an altitude of 400 m on the Iškoras mountain.

those manufactured and sold by the purveyor to the Lepidopterological Society of Finland, the company Tibiale Ltd (www.tibiale.fi). The model of the trap is 0623-S. As bait in the first attempt both beer-based and wine-based mixtures were used at each altitude. In the second attempt only beer-based mixture was employed. As killing

TABLE 1. List of Lepidoptera species from the Iškoras mountain in 2020. The columns are: **A.** Systematic number from Karsholt & Razowski (1996); **B.** Scientific name, from the above catalog; **C.** Number of observed individuals at the altitude 290 m on 15–19 July 2020 using 2 bait traps; **D.** Number of observed individuals at altitudes over 320 m in the same period using 6 bait traps and netting; **E.** Number of individuals at 400 m on 28 July–28 August 2020 using 10 bait traps

A	B	C	D	E
4743	<i>Phiaris metallicana</i> (Hübner, 1799)		1	
4744	<i>Phiaris schulziana</i> (Fabricius, 1776)		5	
4844	<i>Epinotia solandriana</i> (Linnaeus, 1758)			1
5704	<i>Polopeustis altensis</i> (Wocke, 1862)		2	
7013	<i>Colias palaeno</i> (Linnaeus, 1761)		2	
7410	<i>Erebia pandrose</i> (Borkhausen, 1788)		1	
7588	<i>Macaria fusca</i> (Thunberg, 1782)		100	4
8067	<i>Scopula ternata</i> (Schrank, 1802)		10	
8250	<i>Xanthorhoe abrasaria</i> (Herrich-Schäffer, 1855)		3	
8302	<i>Entephria caesiata</i> (Denis & Schiffermüller, 1775)			49
8332	<i>Eulithis populata</i> (Linnaeus, 1758)			12
8346	<i>Dysstroma infuscatum</i> (Tengström, 1869)		1	2
8444	<i>Epirrita autumnata</i> (Borkhausen, 1794)			28
8526	<i>Eupithecia satyrata</i> (Hübner, 1813)		10	
8783	<i>Acrionicta auricoma</i> (Denis & Schiffermüller, 1775)	5	3	
9074	<i>Syngrapha interrogationis</i> (Linnaeus, 1758)			1
9536	<i>Parastichtis suspecta</i> (Hübner, 1817)			1
9655	<i>Lithomoia solidaginis</i> (Hübner, 1803)			43
9989	<i>Papestra biren</i> (Goeze, 1781)		1	
9997	<i>Polia lamuta</i> (Herz, 1903)	1		
10062	<i>Cerapteryx graminis</i> (Linnaeus, 1758)			2
10089	<i>Diarsia mendica</i> (Fabricius, 1775)	10	6	
10093	<i>Diarsia rubi</i> (Vieweg, 1790)	20	32	
10161	<i>Eurois occultus</i> (Linnaeus, 1758)			1
10192	<i>Xestia gelida</i> (Sparre-Schneider, 1883)	1		
10194	<i>Xestia alpicola</i> (Zetterstedt, 1839)	20	58	43
10198	<i>Xestia tecta</i> (Hübner, 1808)			1

agent in the collecting jars tetrachlorethane was used, which evaporates slowly and hence facilitates very long operating times between trap visits (that is, when catches are small and do not fill the jars).

Taxonomy and morphology

According to Varga et al. (2017), *Polia lamuta* was first described by the name *Anarta lamuta* Herz, 1903. Type-locality is in Russia, at the Uruata Camp place, west of Verkhojansk, in the current Republic of Sakha (Yakutia). Syntypes

are 1 male and 1 female, held in the collection of the Zoological Institute, Russian Academy of Sciences, St. Petersburg.

Interestingly, the epithet *asiatica* was first used for another taxon, based on a specimen from Dovre, Norway, held in the collection of the Museum für Naturkunde, Berlin, to describe *Anarta richardsoni* var. *asiatica* Staudinger, 1901. However, the combination with the genus name *Polia* Ochsenheimer, 1816, the epithet was preoccupied, and became a junior secondary homonym of *Polia asiatica* Alphéraky, 1887. The name of that taxon soon turned out to be a synonym of *Bryoxena centralasiae* (Staudinger, 1882).

The closest relative to *Polia lamuta* is *Polia richardsoni* (Curtis, 1835). While the latter has a Holarctic distribution and belongs to the high mountains, the former is restricted to the Palearctic region and lives in forested environments.

There are records in databases from the Nearctic region (Greenland) which the author has investigated but these belong to *Polia richardsoni*. The two species can easily be differentiated by their wing form and the color and markings in the hindwing. The dark central spot in the hindwing is always in different position in these two species.

Really, *Polia lamuta* resembles a double-size *Conanarta cordigera* (Thunberg, 1788) but not with yellow but white rear wings.

Nevertheless, obvious hybrids of the two species *Polia lamuta* and *Polia richardsoni* have been found in Utsjoki at Karigasniemi Ailigas mountain where the ranges of the two species meet (see images and discussion by Pakkanen 2019).

Ecology and behavior

Polia lamuta has a Palearctic distribution. There are records from Magadan across Siberia all the way to Swedish Lapland (FinBIF Portal 2020).

Polia lamuta lives in boreal forests and (according to Erkki M. Laasonen and Leena Laasonen; personal communication) prefers dry sandy soil and sunny exposure where few other Lepidoptera species can be seen. Such habitats in

Lapland often follow a dune-mire mosaic-looking landscape pattern. The habitat of the discovery site is shown in Figures 4 and 5. It is characterized by mountain birch (*Betula pubescens czerepanovii*) and scattered large Scots pine trees (*Pinus sylvestris*).

The immature stages of *Polia lamuta* have been described by Ahola (1986). In captivity its caterpillars have fed on *Vaccinium uliginosum*, *Vaccinium myrtillus*, and *Polygonum* sp. (Ahola and Silvonen 2008). It overwinters first as small larva and for a second time as full-grown larva that does not eat anything after over-wintering. In most of northern Fennoscandia the species is on the wing only on even-numbered years, but in Easternmost Finland, Kola Peninsula, and eastwards on odd-numbered years. Hence, it follows the parasitism-driven alternate-year flight pattern of many other boreal Noctuids (Mikkola 1976). This means that adults of *Polia lamuta* and many other boreal Noctuids cannot be found on Iškoras in the year 2021 but first on 2022.

Based on the 297 records from Finland (FinBIF Portal 2020), *Polia lamuta* is on the wing in early and middle July. According to the collectors consulted (see the section of Acknowledgements) it flies typically in sunshine in the afternoon and in the evening. It does not fly at night and, to the author's knowledge, has not been taken by light at night in Siberia where it flies at lower latitudes where nights are dark. It can be found sitting on tree trunks, fence poles, etc., during the night, mornings, and at cloudy weather. The species flies very fast and rather low over the shrubby vegetation. Because its large size and striking white rear wings it can easily be recognized during the flight but is hard to catch by netting. The flight behavior is quite similar to those of the closely related species *Conanarta cordigera* and *Anarta myrtilli* (Linnaeus, 1761), which have yellow rear wings, but can easily be recognized because it is nearly twice the size of these species and its white rear-wings. Compared with the more distantly related species *Sympistis heliophila* (Paykull, 1793) which lives in the same habitat, is abundant, and does have white rear wings, *Polia lamuta* is double in the size and flies much faster and without whirling about.



FIGURE 4. View of the habitat where the specimen was caught at the altitude 290 m.



FIGURE 5. View of a habitat at about 250 m, by the Iškoras road, that resembles more of the sunny, exposed habitats of the species in Finland, and according to our views is most suitable for *Polia lamuta* (Herz, 1903).

Discussion

The discovery of *Polia lamuta* in Finnmark was result of a targeted search. Without question the species has always lived in that location and can be found there again. It has remained hidden because inner Finnmark is a faraway area only seldom visited by collectors, the species is on the wing only on even-numbered years, and capturing it requires specific methods which have only lately become developed and widely known.

Like *Xestia gelida* and *Polia vesperugo*, the species remained for a long time quite a rarity, but in recent years has become a regular catch. These species belong to an extremely continental, Siberian faunistic element that also live in dry and warm soil and hence may have been favored by the warming climate.

We did not capture *Polia vesperugo* yet from Iškoras, which was somewhat unexpected. The species seemed to have a bad year, as the slim number of records in 2020 from Finland also seem to indicate. *Polia vesperugo* in Fennoscandia lives in mountains at the treeline, which is somewhat higher an altitude to where *Polia lamuta* occurs. That is why we covered a range of altitudes with our traps and in the end placed ten bait traps for a month right onto the treeline. *Polia vesperugo* in Siberia is not rare, but a generalist that flies mainly in the forest region, usually late in the night, and comes eagerly to light traps. For bait traps come mainly females towards the end of the flight period. With this knowledge, maybe in coming years also this other white spot on the Norway map will be filled.

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