

# *Notes on Xestia alpicola ssp. atlantica nov.* (Lep., Noctuidae) on the Faroe Islands

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## Úrtak

Í 1956 var á fyrsta sinni rakt við norðannáttfirvaldin *Xestia alpicola* í Føroyum, eitt kvenndýr funnið á Eiðiskollu. Síðani tá hevur verið leitað við ágrýtni eftir náttfirvaldum í árunum 1990-1995. Í 1996 vóru tríggir kallfirvaldar tiknir í ljósfellu í Kunoy, og ein annar kallfirvaldur varð sæddur á Viðoyinni. Kanningarúrslitini og tilhaldsstøðini hjá honum benda á, at í Føroyum heldur slagið bara til í fjallalíðum úr 300 upp í 600 metra hædd. Føroyska granskingartilfarið, sum ikki er stórt, er alt líka til útsjónar og verður lýst sum nýggj landafrøðilig ætt, ssp. *atlantica nova*.

## Abstract

In 1956 a female of the boreal moth *Xestia alpicola* was found for the first time in the Faroe Islands on Eiðiskollur, Eysturoy. Since then the moth has been eagerly searched for during the years 1990-95. In 1996, three males were caught in a light trap on Kunoy and another male was observed on Viðoy. The findings and habitat claims indicate that the species on the Faroes is restricted to arid mountain slopes 300-600 metres above sea level. The restricted Faroe material is quite uniform in appearance and is described as a new geographical subspecies, ssp. *atlantica*.

## Introduction

On July 18 in 1956 the late Faroese entomologist Leif Dahl made a daytime excursion to the mountainous area of Eiðiskollur on northern Eysturoy, about 4 km north of the village of Eiði. The aim of the excursion was most probably the local Faroese tortri-

cid, *Epinotia mercuriana* Froel., which he two years earlier had observed in plenty there on the same date. Apparently *E. mercuriana* was not out on that occasion, but he caught a female specimen of a conspicuous noctuid moth, which he afterwards set but did not identify. In 1959 he moved to Denmark, where the specimen in question was determined by the renowned Danish entomologist, the late Dr. Niels L. Wolff as a *Xestia alpicola*, a moth hitherto unknown from the Faroe Islands. Some years later Wolff made a brief mention of the find in an updated list of Lepidoptera known from the Faroe Islands (Wolff, 1970). After Dr. Dahl's death in 1982 his entire collection of Faroese and Danish Lepidoptera was transferred to the Faroe Museum of Natural History, Føroya Náttúrugripasavn in Tórshavn (FNT), where the specimen is now preserved.

When the present author in 1990 initiated a study of the lepidopterous fauna of the Faroes, an important aim was to rediscover the species and to provide study material to compare its relationship to the neighbouring populations in Great Britain and Fennoscandia. However, the search continued in

vain to the summer of 1996, when three male specimens were caught on the island of Kunoy and a further male was spotted in the mountains of Viðoy, another of the northern Faroe isles. The aim of the present article has therefore been to discuss the field observations of this highly interesting moth species and to comment on the biology and variation of the Faroe specimens.

#### *Field observations on Xestia alpicola on the Faroes*

During the years 1990-1996 various efforts were made in order to rediscover the species. On August 12, 1990 the locality of Eiðiskollur was visited in order to obtain an overall impression of the habitat. The locality is a mountaineous area about 340 metres above sea level. It consists of a rather flat stony plateau sloping to the east and covered with a semi-alpine vegetation which includes one of the few known sites of *Dryas octopetala* on the Faroes. In the area there are many patches of Crowberry (*Empetrum*), a well-known food plant and protecting place for the hibernating larva of *X. alpicola*: Despite fair weather the species was not observed on that occasion. The following seasons the search included, in the odd years, searches for the larvae under Crowberry clumps on rocky substrates or under moss on rocks in heathy areas on the isles of Sandoy, Streymoy and Eysturoy, as these methods have proved efficient in Great Britain to obtain both young and full-grown larvae during daytime, see e.g. Scorer (1913). In the even years 1992 and 1994 searches for the moth were made, partly by examining isolated rocks in heath areas up

to 600 metres above sea level, or by attempting to catch the male at dawn, where it flies actively according to field observations in Arctic Finland (Mikkola and Jalas, 1977). These methods have also been used by 1900-century British collectors in the Scottish Highlands (Bretherton *et al.*, 1983). In Denmark stray specimens of *X. alpicola* have been caught at mercury vapor light in 1955 and 1965. It seemed therefore possible that the moth might be obtained in the automatic light traps which were operated as part of the general study of the isle of Suðuroy at Akraberg (1990-1993) and Trongisvágur (1994-96), on Stóra Dímun (1994-96), Sandoy (1990-95), Nólsoy (1993-96) and on Streymoy in Hoyvík near Tórshavn (1990-95). Although heath areas with the larval foodplants dominated at the sites in Tórshavn and on Sandoy, no specimens of *X. alpicola* were obtained in the samples. In 1996 two light traps were moved from Sandoy and Streymoy to the northern islands Kunoy and Viðoy and places close to areas with a semialpine vegetation. On Kunoy the trap was situated in the village 100 metres above sea level with about 500 metres to slightly grazed heath areas, and about 1 km to the steep mountain sides which surround the village area from north to southeast. On Viðoy, the other trap was installed on the eastern side of the island, on a site 75 metres above sea level, close to a moderately grazed heath area and with about 1.5 km to the adjacent mountain slopes to the south and west.

Both traps were controlled, usually at weekly intervals, when the contents were taken out and sent by post to Denmark for

closer examination at the Museum of Natural History in Aarhus (MNHA). The Kunoy site produced three male specimens of *X. alpicola*, one in the period from July 14-23, the next from July 24-31, and the last one from August 10-28. The first male was still alive when it arrived in Denmark, indicating that it had probably been attracted to the light on July 23 where the night was mild and calm. Similarly, the third male most probably was attracted during the night of August 13 when the weather conditions were extremely fine, according to the warden of the trap, Mr. Atli Vilhelm. In the Viðoy trap no *X. alpicola* were observed.

In August 1996 the author spent one of his annual visits to the Faroes. Due to excellent weather conditions from August 6 to 10 the field work during daytime was concentrated in the mountains on Viðoy and Kunoy for a search for the moth. At noon on August 8 a resting *alpicola*-male was spotted on Viðoy on a rock under a vegetational clump with Crowberry at an elevation of about 500 metres above sea level. During the attempt to get a good photograph of the specimen, it was disturbed and flew away in a straight and characteristic swift flight and escaped capture due to the uneven terrain and the bright sunlight. Later attempts to discover further specimens there and on similar sites on Kunoy were unsuccessful.

The vegetation and fauna on the Viðoy site looked similar to the habitat on Eiðiskollur where the first Faroe specimen was found. It may therefore be useful to comment on the local habitat conditions



*Fig. 1.* The mountain slopes on the eastern side of Viðoy where *Xestia alpicola* was observed. The background shows the summit of Malinsfjall (751 m) where the subalpine vegetation zone ceases at about 600 m.

which characterize the sites where the moth has been found on the Faroes. The site on Viðoy was a rather steep and well drained fellside with plenty of eroded scree material from the overlying steep mountain (Fig. 1). The vegetation was patchy but contained many flowering species, including *Alchemilla* species, *Oxyria digyna*, *Polygonum viviparum*, *Silene acaulis*, *Thymus*

*drucei*, *Vaccinium myrtillus* and *Empetrum hermaphroditum*. The moth fauna on that day was dominated by many *Entephria caesiata* Den. & Schiff. and *Epinotia mercuriana* Fröl., flying freely together with a few late *Catoptria furcatella* Zett. and *Xanthorhoe munitata* Hb. A similar vegetation characterizes many other mountain slopes at altitudes between 400-600 metres on the northern Faroe isles. Presumably such sites also contain other populations of *Xestia alpicola* which are easily overlooked.

#### *The bionomy of Xestia alpicola in Northern Europe*

The present Faroese *Xestia alpicola*-specimens have all been caught or observed in the even years 1956 and 1996. In this respect the population corresponds closely with the population in Northern Scandinavia, where it and most other boreal *Xestia*-species occur in even years, while in Southern Norway, southwestern Finland and the Baltic countries it mainly occurs in odd years (Mikkola, 1976). The British *X. alpicola*-population which is restricted to the northernmost counties in England, the Scottish Highlands, northern Ireland, the Orkneys and Shetland shows a similar pattern. A biennial pattern corresponding with the Scandinavian and the Faroe Isles has been observed in the Scottish Highlands where populations preferably occur in even years (Bretherton *et al.*, 1983). Regarding the population in Shetland very little recent information exists in the British literature. According to unpublished material gathered by Mr. Mike Pennington, Unst, the available data from the last century in-

dicate that the presumably extinct population on Mainland mainly occurred in the odd years 1881 and 1883, and was found again on Mainland and Unst in 1893, another odd year. However, the last known occurrence in Shetland – the only one known from this century – was in July 1932, an even year (Mike Pennington, i.l. 1996). In the Orkneys the species has only been mentioned once, from the odd year 1895 (South, 1895; Lorimer, 1983). However, in 1986 a male was attracted to mercury vapour light on Orphir during a period with very warm weather (Lorimer, 1993). In Northwestern Ireland the very few observations have also been made in both even (1972) and odd years (1973) (Redway and Heath, 1973; Redway, 1973). In Northern England the local populations also occur in both even and odd years, preferably in odd years (Bretherton *et al.*, 1983).

In the literature there has been some speculation regarding the background of this biennial pattern. Kettlewell, in Ford (1954), proposed that the reason might be found in common parasitism from other alpine moth species flying in the intervening years. Thus the parasites might prevent *Xestia alpicola* from changing flight years. He suggested that the alternate flight years in Scotland of *X. alpicola* and the geometrid moth *Psodos coracina* could serve as an indication for this theory. As *P. coracina* in Northern Scandinavia does not show any alternate-year rhythm, this theory does not seem to be likely. Later on Mikkola (1976) therefore proposed a more elaborate theory. He considers that the biennial regulation is chiefly due to the peculiar biological condi-

tions of these boreal species which have or are thought to have two fixed obligatory diapauses in their larval stage. This feature characterizes the two boreal Scandinavian *Xestia*-species *alpicola* and *speciosa* (Sandberg, 1883). The stable alternate-year cycle may be due to the regulative effect of parasites such as Braconid wasps with an annual cycle. This cycle may constitute an effective barrier prohibiting moths with a »wrong« two-year cycle to increase in the same area. In this way a very stable two year cycle can be achieved. The presence of specimens in an intervening year may therefore either be the result of immigration from neighboring populations with a different year cycle or originate from those few larvae which enter into a third hibernation. This feature in the larval biology of *X. alpicola* was already observed in the last century in Arctic Norway (Sandberg, 1883).

*The variation of the Faroe  
Xestia alpicola* Zett.

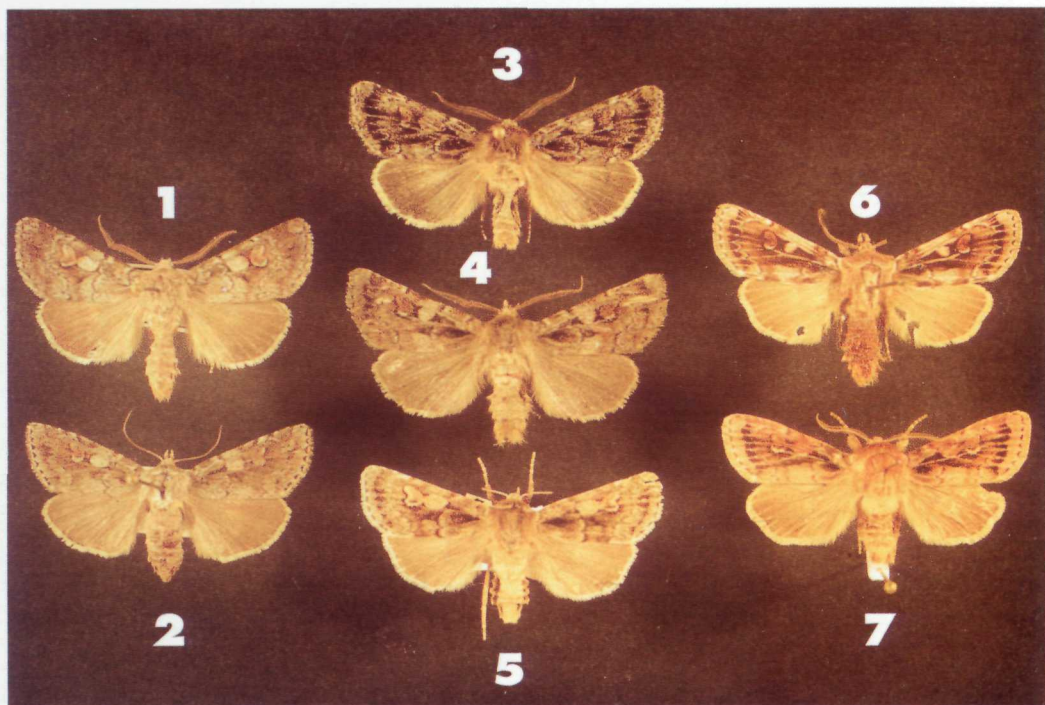
The four Faroe specimens are all of a uniform appearance which differs from the typical ssp. *alpicola* in northern Fennoscandia and ssp. *alpina* from northern Great Britain. Obviously they represent an isolated and hitherto unrecognized local subspecies.

*Xestia alpicola atlantica* subspecies nova: Male wing span ranges from 35.7 to 37.0 mm, mean 36.3 mm. Forewing ground colour uniform dark slate grey with a faint purplish tint, especially along the inner borders of the postmedian line and the reniform stigma. Orbicular stigma pale grey and conspicuous, reniform stigma darker

and surrounded by a distinct black line. Claviform stigma black and distinct. Antemedian and postmedian lines black and without contrasting pale bordering. All males have extended black markings in basal field and well-developed interneural chevrons along termen. Hindwing colour brownish grey, distally darker with a faint discal spot. Female wing span 34.6 mm. Forewing color grey with a contrasting median field with traces of red brown scales located as in the male. Orbicular and reniform stigma well-developed, bright grey and coalescent. Line markings as in male. Hindwings light brownish grey as in the male. The wing colours of the female specimen have faded considerable due to continuous exposure to artificial light in Tórshavn until 1990. Two of the male specimens and the female are shown on Plate 1 together with specimens of ssp. *alpicola* and ssp. *alpina*.

The type material of the female is kept in the Museum of Natural History in Tórshavn and the males in the Museum of Natural History, Aarhus.

Comments. The appearance of the ssp. *atlantica* covers elements both from ssp. *alpicola* and ssp. *alpina*. Thus all Faroe males are larger than the female – a feature which distinguishes ssp. *alpicola* from the Southern Scandinavian race, ssp. *iveni* Hüber, 1870 (Mikkola *et al.*, 1994). Contrary to the Faroe specimens ssp. *alpicola* is characterized by its light brownish grey forewing color and the pale bordering of the median line pattern, and almost no reddish coloring, see e.g. Nordström and Wahlgren (1941) and plate VIII in Mikkola



**Plate I. *Xestia alpicola* from Northwestern Europe**

Figs. 1-2. *X. alpicola alpicola*: 1. male from Arctic Norway, Lakselv 22.vii.1980. 2. female from Arctic Finland, K lpijsj rvi 30.vi.1980 (both from coll. ZMUC).

Figs. 3-5. *X. alpicola atlantica* from the Faroe Islands. 3 and 4: Kunoy, 14-23.vii.1996. 24-31.vii.1996. 5. female, Ei iskollur 18.vii.1956.

Figs. 6-7. *X. alpicola alpina* from Scotland: 6: Without data. 7. Rannoch ex larva 1948 (both from coll. ZMUC)

and Jalas (1977): Compared with ssp. *alpina*, the Faroe specimens show some analogy by their faint purplish tint and strong black markings of the forewing. On the Faroe specimens the purplish tint is mainly present around the reniform stigma like in ssp. *alpicola*. The ssp. *alpina* is generally characterized by its reddish forewing colour, which especially characterizes the variegated Shetland specimens depicted on plate 108 fig. 1-2 in South (1939), and on plate 28 in Ford (1954), and

the specimens from the Scottish Highlands in Perthshire and Aberdeenshire, depicted by Ford (1.c.) and on plate 27 in Skinner (1984) and here on Plate I. The specimens of ssp. *alpina* illustrated in the British literature cited here, deviate furthermore through their narrow forewings, although the general wing span is similar to the Faroe specimens, from 34-40 mm (Brether-ton *et al.*, 1983). This character is also present in the Scottish specimens shown on Plate I. From a zoogeographical point of

view this presence of elements from both adjacent *alpicola*-populations in the Faroe race are suggestive of a clinal variation through the entire area. At the present stage of knowledge the small Faroe material does not permit any definite conclusions with regard to this important question. Until more material has been collected it seems most appropriate to maintain the isolated and deviating Faroe population as a subspecies like the distinctive geometrid moth *Eupithecia nanata zebra* (Wolff, 1929).

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