

# The first record of Silvery Argus *Aricia nicias* (Meigen, 1829) (Lepidoptera, Lycaenidae) in Norway, and notes on its ecology and situation in Fennoscandia

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The Silvery Argus *Aricia nicias* (Meigen, 1829) has a limited distribution in central parts of Sweden and the southern half of Finland, and the two countries share a population just north of the Gulf of Bothnia. In July 2006, the species was found in Norway for the first time; at three sites in a small area in the very eastern part of Hedmark County, close to its most western outpost in Sweden. This is supposedly the first record of a new butterfly species in Norway for 70 years. The present paper describes the species' appearance and biology, as well as its occurrence, situation and potential threats in Norway and elsewhere.

Key words: *Aricia nicias*, butterflies, new to Norway, threatened species, cultural landscape.

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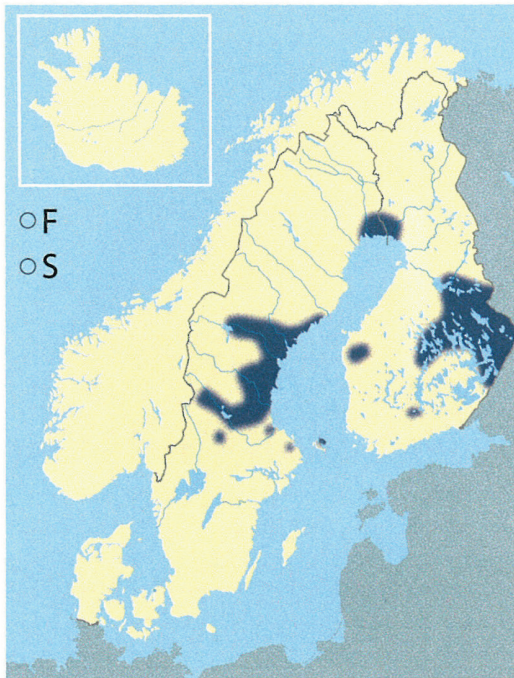
## INTRODUCTION

The Silvery Argus *Aricia nicias* (Meigen, 1829) is represented in Fennoscandia by the subspecies *Aricia nicias scandicus* (Wahlgren, 1930). In Sweden, the species occurs from the northern part of Uppland to Jämtland, Ångermanland and Dalarna, as well as just north of the Gulf of Bothnia (figure 1). It is normally quite rare, but can locally be rather numerous. Permanent snow cover during winter is suggested to be a prerequisite that limits its breeding range to the south (Eliasson 2005, Gärdenfors 2005).

The species was not known in Norway until 2006 when it was found by the authors. This is a bit surprising since its distribution along Västerdalälven river, far west in Dalarna County in Sweden, reaches almost to the Norwegian

border by Trysil in Hedmark County (figure 1, Eliasson 2005), and parts of the same river system flows into Norway (C.U. Eliasson, pers. comm.). However, already Bakke (1975) suggested that it may occur in Hedmark, in the areas bordering on Sweden. Further, the species is distributed in several separate areas in Finland, the eastern Pyrenees, the Alps, Ural and Altaj.

According to Gärdenfors (2005), the Silvery Argus expanded its distribution range in Sweden during the 1940ies. Its population trend is negative in Sweden and Finland, but is considered to be stable in the rest of Europe (Van Swaay & Warren 1999, Eliasson 2005). The Silvery Argus is one of nine butterflies classified as 'vulnerable' (VU) in the Swedish Red List, and it is listed as 'rare' in Finland and Spain (Gärdenfors 2005).



**Figure 1.** Distribution in Fennoscandia, also indicating the proximity of the Swedish distribution to Norway. Reprinted from Eliasson et al. (2005) with permission from the Swedish Species Information Centre (ArtDatabanken).

## APPEARANCE, HABITAT, THREATS AND BEHAVIOUR

The Silvery Argus is rather small with a wingspan of 25-28 mm. In the male, the upper sides of wings are lightly greenish blue (turquoise) with sharply delimited, broad, dark brown submarginal bands (figure 2). The wings of the female are somewhat darker, brownish grey, with some blue scales at the base. Along the middle part of the underside of the hindwing runs a characteristic, long, wedge-shaped and dirty-white stroke, from the outer edge spots close up to the base (i.e. clearly beyond the disc spot; figure 3). For further details see Eliasson (2005) and Söderström (2006).

The species is found in meadow areas with abundance of the host plant Wood Cranesbill *Geranium sylvaticum*, which also is one of several feeding plants for adults. In calcareous areas, it

may be found in power line clearings, road and railway cuts with sandy soil, as well as along forestry roads and sometimes in clear-cut areas and clearings connected to more stable environments. The Silvery Argus may also occur in grazed woodland pasture with brinks, in ravine meadows with difficult access for livestock, and in slopes. Its primary habitat is grazing and traditional hay mowing land that has not been used for a while, but still is not reforested.

The occurrence of the Silvery Argus in lower Norrland and Dalarna is highly concentrated to river valleys and summer farms. In the river valleys, the species is often found in meadows near the river (C.U. Eliasson, pers. comm.). Its living space shrinks primarily because flat and easily operated land often is fertilized and exploited more intensively for grazing and mowing today. In addition, traditional mowing once late in the season is often being replaced by early and recurring mowing for ensilage, while remaining meadows with many obstructions to automatic harvesting are reforested naturally (Eliasson 2005, Gärdenfors 2005). Even changed forestry practices, with large clear-cuttings far apart from each other instead of more continuous harvesting of individual trees in smaller areas, as well temporary instead of permanent timber storage sites, may have influenced the occurrence of Wood Cranesbill and hence the Silvery Argus negatively (Gärdenfors 2005, C.U. Eliasson pers. comm.).

Its flight time varies from the end of June until mid-August. Foraging is often on Cranesbills *Geranium* spp., thistles (subfam. Carduoideae (Asteraceae)) and clovers *Trifolium* spp. (Söderström 2006). However, a large spectrum of food plants are used by adult butterflies (Wiklund 1977).

The nominate form in the Alps deposits its eggs in the flower, and the larvae winters in an early stage. At our latitudes, the eggs are usually deposited on wilted, rolled-up leaves of Wood Cranesbill and winter there. Meadow Cranesbill *Geranium pratense* may be used as an additional host plant a few places in Sweden (Gärdenfors



**Figure 2.** The upperside of a Silvery Argus male, showing the characteristic features. Skutskär, Uppsala, Sweden 11 July 2004. Photo: Bo Söderström (from Söderström 2006).

2005). The behaviour of other development stages in Fennoscandia is unknown.

## RECORDINGS FROM NORWAY

On 26 July 2006 we found the Silvery Argus at three sites, 1-2 km apart, in Ljørdalen, Trysil Municipality, Hedmark County (61°19'N, 12°44'Ø). Incidentally, the localities are distributed a little more than one kilometre on each side of two EIS squares: EIS 56 and EIS 65. The area is located in the slightly continental section, middle boreal zone (MBC1), a vegetation-geographical region with a rather limited distribution in Norway (Moen 1998).

The average normal precipitation for eight meteorological stations in Trysil (the period 1961-1990) is 752 mm for the whole year, fairly evenly spread. The average normal temperature for three stations in Trysil (1961-1990) is -8.0 °C for first quarter, +7.2 °C for second quarter, +11.3 °C for third quarter and -3.2 °C for fourth quarter. Permanent snow cover at the closest meteorological station is on average from 14 November (The Norwegian Meteorological Institute; [www.met.no](http://www.met.no)).

The three sites where we found the Silvery Argus are all situated 430-480 m a.s.l, 4-6 km from the Swedish border. They have some common features, all being summer farms or small farms where the surrounding meadow areas (considerable less



**Figure 3.** The wing undersides are very similar for both sexes, and the wedge-shaped and dirty-white stroke clearly passing the disc spot is species diagnostic. Female at Skaftet, Ljørdalen 26 July 2006. Photo: Christian Steel.

than a hectare on each) have not been grazed or mowed for several years, and the Wood Cranesbill population is substantial.

The locality at Gullsetmora was investigated more thoroughly, but many aspects of this site are shared by the two others. Judged by flora and vegetation on photographs and a brief species inventory, there seems to be little that separates it from hundreds of similar sites in Norway (J. Wesenberg in litt., figure 4). The composition of plant species is trivial and robust, with apparently no demanding traditional hay meadow species.

Generally in the area, the forest is dominated by Scots Pine *Pinus sylvestris*, but at some places there are a few Norway Spruce *Picea abies* and Birch *Betula pubescens*. The immediate surroundings of the sites are relatively moist, and the Pine forest is replaced by Spruce and Birch, as well as some bushes and other trees. The area has quite a few old traditional hay meadows, especially along the river (A. Skjærbæk, pers. comm.). Suitable habitats for the Silvery Argus stand out as smaller 'islands' in the larger landscape.

## LOCALITIES

Hedmark (HE), Trysil, Ljørdalen:

Gullsetmora summer farm (UTM 33V UJ 794 011) 26 July 2006, 2 ♂ 1 ♀ collected. At least 2 ♂ 1 ♀ seen in addition. 8 August 2006, negative.

Voll farm (UTM 33V UH 800 986) 26 July 2006, 1 ♂ 1 specimen not sexed. 8 August 2006, 1 ♀ collected.

Skaftet farm (UTM 33V UH 791 985) 26 July 2006, 1 ♀. 8 August 2006, 1 ♂ collected.

Three specimens from the first locality are in the private collection of the second author, while the two specimens collected 8 August are deposited at the Natural History Museum, University of Oslo; all those five with wingspans of 25-27 mm. Several of the specimens not collected were photographed.

The males at Gullsetmora were more active than the females and could fly for long periods. Autumn Hawkbit *Leontodon autumnalis* was visited from time to time, and one specimen also visited European Goldenrod *Solidago virgaurea*. Both a female and a male were seen flying even when overcast. Courtship and mating was observed once at Gullsetmora. A very fresh-looking male sat calmly with its wings straight out, while the female whirred above for a long time and then sat still for a short period after having mated. At least one female was seen with oviparous behaviour inside wilted, curled-up leaves of the host plant Wood Cranesbill, but we could not find any eggs afterwards. Failed attempts to oviposit is however not unusual (Wiklund 1977). The Silvery Argus was apparently the dominant butterfly species at this site that day.

## DISCUSSION AND CONCLUSION

The Silvery Argus obviously has a very limited distribution in Norway. During our two visits in 2006, we found several seemingly excellent areas with suitable habitat for the species close to the



**Figure 4.** The site Gullsetmora in Ljørdalen 26 July 2006, when and where the species was found for the first time in Norway. The lack of cultivation, but still fairly open character, is evident. Photo: Christian Steel.

three localities where it was found, indicating that there may be space for a self-sustaining population. It is mostly the areas east in Trysil that are close to the known Swedish distribution, but fairly isolated populations are known from Sweden (Gärdenfors 2005). Wood Cranesbill is one of the most common plants in Norway (J. Wesenberg, pers. comm.). It is therefore difficult to envisage that this or other plant species could be limiting factors, while climate and general vegetation geography appear as more likely explanations, also taking into account major changes in the cultural landscape.

It is unknown whether the species has inhabited Trysil permanently or sporadically for a long time, or if the occurrence is a more recent spread from Sweden. It may also be that the species appears here only in particularly favourable summers, and is highly dependant on developments in Sweden. The summer of 2006 was generally the best for butterflies since 1976, at least in large parts of Southern Norway, and even 2005 was good (L. Aarvik, pers. comm.).

In eastern parts of Trysil, as in many parts of Norway, the cultural landscape has been through major changes. The usage of the farming areas was quite different only a few decades ago. This may have heavily influenced the occurrence of the Silvery Argus in these areas. Extensive fragmentation of suitable habitats and reduction of the landscape mosaic of earlier days has led to isolation and breakdown in metapopulation dynamics and constitutes a major threat to this and other rare butterfly species (Gärdenfors 2005). The Silvery Argus has already decreased dramatically in Finland and lower-lying parts of Sweden, which is a warning signal.

The further development and management of the cultural landscape will undoubtedly influence on this species' future situation in Norway. The site in Sandviken, Dalarna where C. Wiklund (pers. comm.) studied the Silvery Argus 30 years ago (jf. Wiklund 1977) does no longer hold the species, because the summer farm again are in use, and lots of livestock makes the place inhabitable. Specific silvicultural measures, involving mowing and/or

strictly controlled grazing, should probably be initiated in at least parts of the known sites in Norway. It is also possible that the species, like some other cultural landscape species, can find a refuge along roadsides, which to some extent simulates traditional hay meadows if herbicides are not used and cutting regimes are well planned (see Gerell 1997).

If our findings had been published before the new Norwegian Red List was completed (Kålås et al. 2006), the species most likely would have been redlisted (L. Aarvik, pers. comm.).

Including the authors' finding of the Silvery Argus, 99 butterfly species have by now been recorded in Norway, of which 16 are blues species and three of those in the genus *Aricia* (see Aarvik et al. 2000). The previous new butterfly species to Norway was supposedly the Clouded Apollo *Parnassius mnemosyne* (L. Aarvik, pers. comm.), which was found for the first time in 1936 (Werner 1937), but which certainly had occurred in Norway before this.

The Norwegian name 'kileblåvinge' was suggested by Irene Inman Tjørve (Tjørve & Trolle 1999). We think this is an appropriate and striking name, because the whitish wedge-shaped stroke at the underside of the hindwing is a diagnostic hallmark for both sexes of the species ('kile' is Norwegian for 'wedge').

The authors plan additional field surveys in the area during the summer 2007, and encourage anyone with relevant information to contact us.

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