

Eupithecia veratraria Herrich-Schäffer, 1850
new to Scandinavia, with the redescription
of *E. veratraria* ssp. *arctica* Viidalepp, 1974
(Lepidoptera, Geometridae)

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Summary

The occurrence of *Eupithecia veratraria* H.-S. in Fennoscandia is confirmed. Three populations of this species, one of them abundant, were found in Tana and Berlevåg communes, northernmost Norway. The larvae feed on *Veratrum album* L., the only known host plant of the species. Compared to central European specimens, those from Norway are characterised by an indistinct wing pattern and smaller size. The Norwegian population is considered to belong to ssp. *arctica* Viidalepp, described from the Polar Urals. *E. v. arctica* is redescribed on the basis of new material from the type locality.

Zusammenfassung

Das Vorkommen von *Eupithecia veratraria* H.-S. in Fennoskandien konnte bestätigt werden. Drei Populationen dieser Art, eine davon zahlreich, wurden in den Gemeinden Tana und Berlevåg im nördlichsten Norwegen gefunden. Die Raupen leben an *Veratrum album* L., der einzigen bekannten Futterpflanze dieser Art. Im Vergleich mit zentraleuropäischen Tieren sind die Falter aus Norwegen kleiner und haben eine unscharfe Zeichnung. Die norwegische Population wird als ssp. *arctica* Viidalepp angesehen, eine aus dem nördlichen Ural beschriebene Unterart. *E. v. arctica* wird auf Grund neuer Materialien aus dem Typenfundort nochmals beschrieben.

Résumé

Les auteurs confirment la présence d'*Eupithecia veratraria* H.-S. en Fennoscandie. Ils ont trouvé trois populations de cette espèce, l'une d'entre elles abondante, dans les communes de Tana et Berlevåg, dans l'extrême nord de la Norvège. Les chenilles se nourrissent de *Veratrum album*, seule plante-hôte connue de cette espèce. Comparativement aux exemplaires d'Europe

centrale, les *veratraria* de Norvège se caractérisent par un dessin flou et une taille plus petite. On considère la population de Norvège comme appartenant à la ssp. *arctica* Viidalepp d'écrite de la partie polaire des Monts Oural. Re-description de la ssp. *arctica* sur la base du nouveau matériel de la localité-type.

Introduction

Eupithecia veratraria Herrich-Schäffer, 1850, is a transpalaeartic species which displays an alpine distribution throughout the mountains of central Europe. Its occurrence in northern Europe westwards from Russia has been disputed for a long time. *E. veratraria* was reported from northern Norway by earlier sources (Schneider, 1893; Haanshus, 1933; Juul, 1948). Later, these records were considered doubtful (Knaben, 1976) and recent faunistic reviews (Skou, 1984; Mikkola *et al.* 1989) did not consider the species as belonging to the fauna of the Fennoscandian countries. *E. veratraria* has repeatedly been mentioned also from the Baltic countries (e.g. Šulcs & Viidalepp, 1972). However, these reports have turned out to be based on misidentifications (Šulcs *et al.*, 1981).

Closest to Fennoscandia, *E. veratraria* is known to occur in the Ural Mountains (Viidalepp, 1974 and pers. comm.). In addition, one confirmed specimen was collected at Ponoï in eastern Kola peninsula (Fig. 1, D) in 1899 (Kozlov & Jalava, 1994). *Veratrum album* L. (Liliaceae), the only known host plant of *E. veratraria*, occurs continuously from the Polar Urals westwards to Arctic Norway (Hultén & Fries, 1986). The record from Kola indicates that *E. veratraria* probably follows the range of its host plant throughout north-eastern Europe. Its occurrence in northernmost Norway could therefore be expected.

New records from Norway (Fig. 1)

In August 1993 three larvae of this species were found in an inflorescence of *V. album* close to Vestertana (70°26'N, 27°50'E) in northernmost Norway. Further records were made in September 1993, when hundreds of larvae of *E. veratraria* were collected at Leirpollskogen (70°27'N, 28°40'E). Some larvae were also found at Store Molvik (70°47'N, 28°45'E). On 20th July 1994, 27 adults (8 ♂♂, 19 ♀♀) were collected at Leirpollskogen where also naturally laid eggs were found. On 22nd July, 11 more specimens (6 ♂♂, 5 ♀♀) were collected at the same locality and 3 (1 ♂, 2 ♀♀) specimens in the vicinity of Vestertana (J. Pöyry leg.).

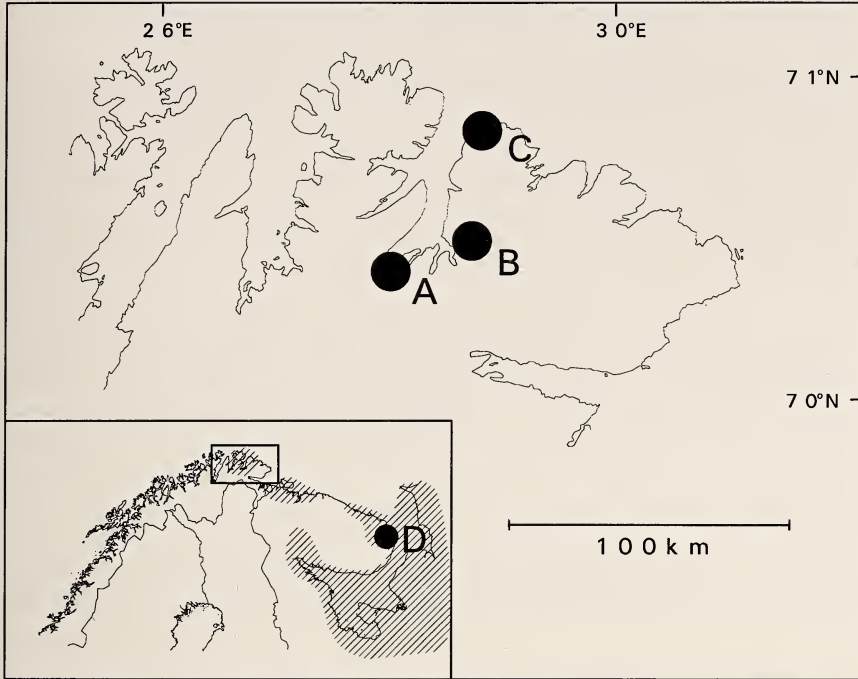


Fig. 1. Records of *Eupithecia veratraria* (dots) and the main distribution of its host plant *Veratrum album* (shaded) in northernmost Europe. Localities mentioned in the text : A — Vestertana, B — Leirpollskogen, C — Store Molvik, D — Ponoï.

At Leirpollskogen and Vestertana, the species was found in luxuriant mountain birch (*Betula pubescens tortuosa* (Ledeb.) Nyman) forests and on half-open pastures where *V. album* grows along streams ; Store Molvik is situated north of the timberline, *V. album* grows on river banks at a coastal settlement there. All localities are situated at low altitudes (0 - 50 m above sea level). *E. veratraria* was not found at higher altitudes in spite of the abundant occurrence of the host plant there.

Main subspecies of *E. veratraria*, and the subspecific status of the Norwegian population

Since the eastern subspecies of *E. veratraria* are little known, it is pertinent to give a short review of the subspecific division of this species.

The nominate subspecies *E. veratraria veratraria* Herrich-Schäffer, 1850 from mountains of central Europe is characterised by a uniform ground

colour and a distinct wing pattern consisting of a black discal spot, black vein streaks and scattered white markings (Fig. 2).

All southern Siberian populations from the Altai mountains to the Pacific are considered to belong to *E. veratraria homophaea* Djakonov, 1926 (Mironov, 1991). The moths are smaller and have a more irregular fasciate wing pattern than the nominate subspecies, and the black vein streaks, typical for *E. v. veratraria*, are absent. The discal spot may be weak or absent. Terminal and costal parts of the forewing are usually darkened, the latter sometimes reddish brown.

E. veratraria arctica Viidalepp, 1974 was described from northern parts of the Ural Mts. as a small subspecies with indistinct wing pattern (Viidalepp, 1974). Since the original description was based on only 2 specimens, and the range of variation was unknown, we give a re-description of it on the basis of new material from the type locality.

Eupithecia veratraria ssp. *arctica* Viidalepp, 1974

REDESCRIPTION : Wingspan 18 - 22 mm (males), two females 17 and 24 mm. Forewing leaden grey with weak yellowish tinge. Wing pattern



Fig. 2. *Eupithecia veratraria*. Upper row : ssp. *arctica*, Tana, Norway, ♂♂♀♀; middle row : ssp. *arctica*, Polar Urals, ♂♂♀♀; lower row : ssp. *homophaea*, Primorye region, ♂♀; ssp. *veratraria*, central Europe, ♂♂.

variable, markings highly diffuse with little contrast except small discal spot. Distally often unicolorous, darker grey, subterminal fascia weak or absent. Costal area usually darkened, but never brownish. Cilia weakly spotted. Hindwing as forewing, discal spot sometimes absent.

The moths lack the sharply traced dentate fasciae typical for *E. v. homophaea* as well as the spotty pattern of the nominate ssp. No differences in the structure of either male (including examination of everted vesica) or female genitalia were found between *E. v. arctica* and other subspecies.

The wild-caught specimens from Norway closely resemble the moths from the type locality of *E. v. arctica* in their external appearance (Fig. 2). However, the Norwegian specimens seem to be more variable, including specimens with a clearly fasciate wing pattern. Characteristic traits of the Norwegian population are unicolorous cilia and no darkening of the costal region of the forewings. No differences in genital structure were found. Many reared Norwegian individuals, but none wild-caught from the same locality, resembled the ssp. *veratraria* by having a uniform ground colour and well-developed subterminal fasciae. The genetic background of some of the subspecific differences can therefore be questioned.

As the differences between the Ural and Norwegian populations are, in our opinion, minor, we consider the Norwegian population as belonging to *E. veratraria arctica*. The view is supported by the continuous distribution of *Veratrum album*, and therefore most probably also of *E. veratraria*, from the Urals to Arctic Norway.

MATERIAL EXAMINED

ssp. *veratraria* — **Central Europe** : 9 specimens labelled “Dietze” ; 2 ♂♂ labelled “Wien, Isaak” (ZBI) ; 1 ♂ labelled “Bohemia” and “Staudinger” (ZMH) ;

ssp. *homophaea* — **Russia** : Altai Mts., 12 specimens (ZMH) ; Primorye region, 14 ; Khabarovsk region, 7 ; Kemerovo region, 1 (ZBI) ;

ssp. *arctica* — **Russia** : Polar Urals, Krasnyi Kamen (66°53'N 65°10'E) 16.07.1969. (in the original description erroneously 16.05.), 1 ♂, holotype, (ZBI) ; *ibidem*, 15.-16.07.1994, 2 ♂♂, J. Kullberg, J. Jalava and S. Koponen leg. ; Ob delta, 8 km N Labytnangi (66°42'N 66°35'E), 27 ♂♂, 2 ♀, J. Kullberg, J. Jalava and S. Koponen leg. (ZMH) ; Kola peninsula, Ponoï, 1899, 1 specimen (ZMH) ; **Norway** : Berlevåg commune, autumn 1993, 1 ♀ ex larva ; Tana commune, autumn 1993, 37 specimens ex larva ; *ibidem*, 41 specimens, 20.-22.07.1994 (ZBI, ZMH, authors' and J. Pöyry's private collections).

ABBREVIATIONS

- ZBI Institute of Zoology and Botany of the Estonian Academy of Sciences, Tartu, Estonia
ZMH Zoological Museum, Finnish Museum of Natural History, Helsinki, Finland.

Description of the preimaginal stages and notes on ecology

At Leirpollskogen, eggs of *E. veratraria* were found singly on stamens of *V. album*. They were about 0.5 mm long and 0.3 mm wide, and varied from white to orange in colour (probably, due to different age). In some cases, there were up to three eggs per flower of *V. album*.

In late August — early September 1993 most of the larvae collected were full-grown and pupated within a few days in the laboratory. They were dark brown to black in colour, without any pattern, and up to 12 mm long. The larvae match perfectly with the description of *E. veratraria* larvae from Central Europe (Dietze, 1913 ; Weigt, 1990), both in appearance and feeding habits. About 10% of the larvae were parasitised by *Campoletis rectangulata* (Aubert, 1977) (Hymenoptera, Ichneumonidae). This species was hitherto known only from the Alps (R. Jussila, pers. comm.).

Larvae pupated in soil within a thin but tough cocoon. The dark yellow pupae were about 7 - 8 mm long. After the first hibernation, less than 10% of pupae gave adults and more eclosed after the second winter. This suggests a strong inclination of Norwegian *E. veratraria* pupae for multiple hibernations, as is characteristic for central European populations (Dietze, 1913). We would expect a strong natural selection for such an emergence pattern since *V. album* does not bear flowers every year.

Most adults collected 20th-22nd July 1994 were in worn condition and the sex ratio was female-biased. We conclude that the peak flight was one or two weeks earlier, *E. veratraria* is thus a species of subarctic midsummer. The adults were observed in flight during the evening (about 18.30 - 19.30 local time) but not at noon, and they were only found in the close vicinity of their host plant. They were observed feeding on flowers of *V. album*.

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