

## Relict population of *Glacies alpinata* (Geometridae, Lepidoptera) in the Czech part of the Králický Sněžník Mt.

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**Abstract:** Alpine areas represent island-like habitats. In Czechia, such habitats are very limited in extent but host unique relict and endangered fauna and flora. Among the species exclusively associated with alpine (subalpine) habitats is *Glacies alpinata* (Scopoli, 1763) (Geometridae, Lepidoptera). Until now, this species has only been documented at the highest elevations of the Krkonoše and Jeseníky Mountains in Czechia. Its occurrence in the forest-free summit area of the Czech part of the Králický Sněžník Mt., however, has not previously been explicitly confirmed. In 2025, we recorded the presence of *G. alpinata* in the summit area of the Králický Sněžník Mt. This represents the first documented confirmation of a relict, isolated population of the species on the Czech side of the border. The population, potentially threatened by climate change, may benefit from ongoing management measures such as mowing and restoration of alpine treeless habitats at the summit of the Králický Sněžník Mt.

**Keywords:** alpine habitats, conservation status, Czech Republic, faunistics, Silesia

### Introduction

*Glacies alpinata* (Scopoli, 1763) is a European alpine species with peri-alpine disjunction. Caterpillars are polyphagous, feeding on various low-growing plants (e.g., *Vaccinium*, *Rhododendron*, *Leontodon*) (Müller et al. 2019). Adults are diurnal and occur from June to July, flying even during very short periods of sunshine (Macek et al. 2012).

The species is widespread in the Alps, but with scattered distribution in the southwestern Alps, Carpathians, and the High Sudetes Mountains (Müller et al. 2019). In the High Sudetes Mts., *G. alpinata* occurs only in isolated populations in the Krkonoše Mts. [= Riesengebirge], Hrubý Jeseník Mts. [= Altvatergebirge], and the summit area of the Králický Sněžník Mt. [= Glatzer Schneeberg] (Povolný & Moucha 1955; Kuras et al. 2009; Čížek et al. 2016, 2018). From the borderland mountains of the Krkonoše and Králický Sněžník, *G. alpinata* is also reported from the Polish part of the mountains (Raebel & Toll 1962; Malkiewicz 2012).

We have only occasional reports of *G. alpinata* from the Králický Sněžník Mt. The first record of the species in the region comes from the mid-19th century (Wocke 1872), and this record was subsequently followed by Skala (1912–1913, 1936) and Raebel & Toll (1962). In the early 20th century, Stephan (1925) again noted its occurrence, describing it as irregular and restricted to late June–July. At the end of the 20th century, Skalski (1997) reported the occurrence of *G. alpinata* in 1992 as “relatively common”. However, Malkiewicz (2012) later corrected this assessment, reporting that *G. alpinata* occurs only sporadically in the Králický Sněžník Mt.

In the Red List of Threatened Invertebrates (Hejda et al. 2017), *G. alpinata* is assessed as Near Threatened (NT) due to its relatively stable occurrence in Czechia. While its population

status appears favorable in the Krkonoše Mts. (Čížek et al. 2016, 2018; AOPK 2025: Pavlíčko A. & Vodrlind B.), a significant decline has recently been observed in the Hrubý Jeseník Mts., where the species has not been recorded since 2018 despite intensive annual surveys (AOPK 2025: Beneš J. & Spitzer L., observ.). In the Polish region of Silesia, the species is classified as Vulnerable (VU) (Malkiewicz 2012).

If we summarize the information about the occurrence of *G. alpinata* in Králický Sněžník Mt., we can conclude that there is very little evidence of its occurrence in the region. The information about the species' occurrence in the area is mostly adopted from various authors. There are no documented records of the species on the Czech side of Králický Sněžník Mt.

## Results and discussion

Here we present the first documented record of *Glacies alpinata* from the Czech part of the Králický Sněžník Mt.

Mat.: **Velká Morava** (5767c), 1 ♂, 17.vi.2025, (+ 2 ex. observed, 18.vi.2025), L. Spitzer leg. et coll.

Note: the summit area of the Králický Sněžník Mt., treeless habitat near the summit border trail: GPS: 50.2074075N, 16.8485858E, 1420 m a.s.l., 17. vi. 2025, 1 ex.; 50.2071003N, 16.8493017E, 1415 m a.s.l., 18. vi. 2025, 2 ex.

The presence of *G. alpinata* has been known in the Králický Sněžník Mt. since the second half of the 19th century (Wocke 1872; Stephan 1925). However, old records from the 19th and first half of the 20th century are not precisely localized, so it is unclear whether they belong to Poland or Czechia. More recent records from the end of the 20th century can be clearly assigned to Polish territory (Skalski 1997; Malkiewicz 2012). Although the occurrence of the species on the Czech side of the Králický Sněžník Mountain was long expected, this represents the first documented record from the Czech part of the range. This record is particularly significant given the very limited number of documented occurrences from this locality.

The population of *G. alpinata* on the Králický Sněžník Mt. has a relict glacial origin and is obviously extremely isolated. Moreover, the species is localized in a very small habitat covering approximately 65 hectares of primary (sub)alpine treeless summit area (Tremel & Banaš 2000). The population is thus directly threatened with extinction. This situation is further exacerbated by global and local drivers such as climate change, nutrient deposition, the expansion of blueberry (*Vaccinium myrtillus*) and non-native dwarf pine (*Pinus mugo*). These processes result in vegetation homogenization and continued reduction of the treeless summit area of the Králický Sněžník Mt. (Tremel et al. 2016; Zeider et al. 2023). In addition, the development of tourist activities in the summit area probably also contributes to these negative impacts (see Fig. 1).

Only a few species with arctic-alpine distribution and an association with treeless mountain areas have survived in the summit area of the Králický Sněžník Mt., e.g. *Incurvaria vetulella* (Zetterstedt, 1839), *Rhigognostis senilella* (Zetterstedt, 1839), *Chionodes viduella* (Fabricius, 1794), *Clepsia rogana* (Guenée, 1845), *Sparganothis rubicundana* (Herrich-Schäffer, 1856), *Epichnopteryx cf. ardua* (Mann, 1867), etc. (Stephan 1925; Groschke 1939; Malkiewicz & Kania 2023). The populations of all these species are biogeographically unique and probably face imminent extinction. Unfortunately, almost nothing is known about their current status.



**Fig. 1:** View towards the summit of the Králický Sněžník Mt., 17 June 2025. Photo by L. Spitzer.

**Acknowledgements:** We thank Mr. Roland Dobosz for providing some inaccessible literature, and Martin Konvička (České Budějovice), Zdeněk Laštůvka (Brno) and Jan Sitek (Frýdek-Místek) for their critical review of the manuscript. This study was supported by the Agency for Nature Conservation and Landscape Protection of the Czech Republic (AOPK Praha), by project IGA PrF 433104931/31 and by the budget of the Museum of the Moravian Wallachia Region, Vsetín.

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