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Occurrence of *Isturgia roraria* (Geometridae, Lepidoptera) in Czech Silesia in the context of its distribution in Poland

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Abstract: Here we present and discuss the record of the endangered species *Isturgia roraria* (Fabricius, 1776) in the Czech Silesia, originating from the Zlatohorská vrchovina (Zlatohorská Highlands) in the cadastral area of the village Dívčí Hrad (Bruntál District). The record confirms the presence of the species in Czech Silesia after more than 100 years and corresponds to its distribution in adjacent Poland. Together with the occurrence of *I. roraria* in the Bílé Karpaty Mts., this constitutes the only other known area of distribution in Czechia. In Silesia, the population of *I. roraria* is strictly associated with one of its host plants, *Cytisus scoparius* (L.), and with semi-ruderal habitats such as forest clearings, forest edges, clear-cuts and abandoned pastures. Current knowledge of the Lepidoptera fauna in the Zlatohorská vrchovina Highlands is very limited; therefore, detailed entomological surveys will likely reveal additional localities of the species (especially in the area defined by the settlements of Janov, Jindřichov, Krnov, Město Albrechtice and Slezské Rudoltice). The conservation status of the isolated Silesian population is unclear; however, considering its trophic and habitat associations, the Silesian population appears to be less threatened than the one in the Bílé Karpaty Mts.

Keywords: Bílé Karpaty, conservation status, Czechia, distribution, faunistics, Moravia, Silesia, Zlatohorská vrchovina

Introduction

The genus *Isturgia* Hübner, 1823, a member of the subfamily Ennominae Duponchel, 1845 contains approximately 60 species distributed in the Palaearctic, mainland Oriental and Afrotropical regions (Skou & Sihvonen 2015). Sixteen species have been reported from Europe and three, i.e. *I. roraria* (Fabricius, 1776), *I. murinaria* ([Denis & Schiffermüller], 1775) and *I. arenacearia* ([Denis & Schiffermüller], 1775), have been reported from Czechia (Laštůvka et al. 2023).

Isturgia roraria (Fabricius, 1776) is a locally occurring and rare European species (see Fig. 1). Its area of distribution is scattered, from central and south-eastern Germany, throughout central and eastern Europe and parts of the Balkans to the Ural Mountains (Skou & Sihvonen 2015). In south Poland, it reaches the north-western limit of its range (Blaik 2003). *I. roraria* belongs to bivoltine species with overlapping generations. The adults are on the wings from late April to mid-August. It inhabits warm, sun-exposed slopes with stands of its catterpillars´ food plants, i.e. *Cytisus* and *Genista* species (Ebert 2003, Macek et al. 2012). The adults are diurnal and active in sunshine (Skou & Sihvonen 2015), but they are also attracted to light at night (*pers. observ.*). In Czechia, it is considered a very local and rare species. It is listed in the Red List of Invertebrates of the Czech Republic (Hejda et al. 2017) as a critically endangered (CR) species. The conservation status of the species in Poland is endangered (EN) (Malkiewicz 2012).

The aim of this study is to summarise previous publications on the occurrence

of *I. roraria* in Czechia, and to provide new information regarding its distribution and conservation status. Additionally, we aim to characterise typical habitats in the Silesian region.

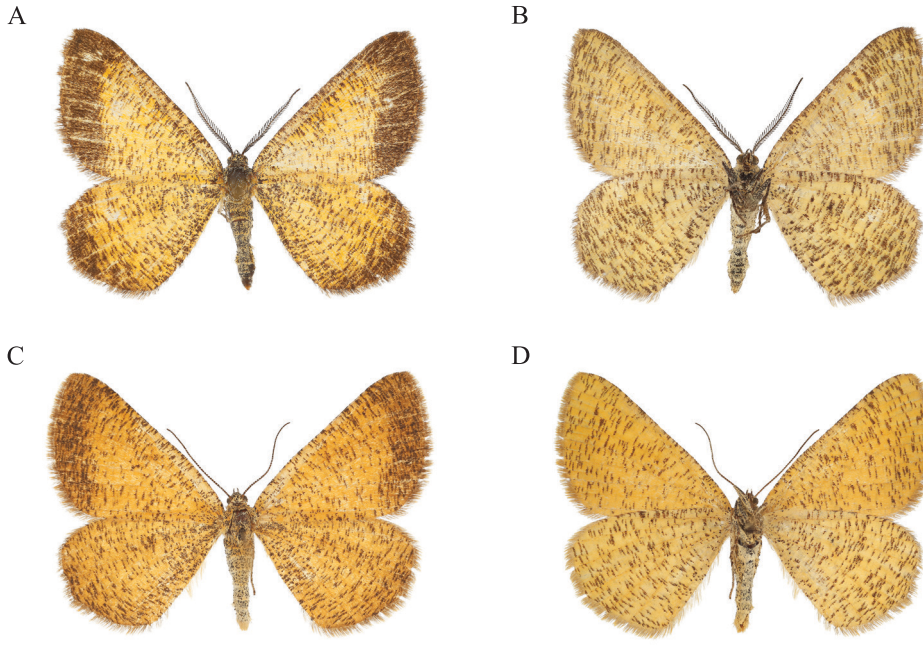

Fig. 1: *Isturgia roraria* – male (upper side A, underside B; wingspan: 24.8 mm) and female (upper side C, underside D; wingspan: 26.1 mm); Dívčí Hrad, 17 June 2025. Photo by J. Sitek.

Distribution in Czechia

In Czechia, *I. roraria* has so far been recorded only from Moravia and Silesia. The earliest Moravian records date to the second half of the 19th century in Brno (= Brünn; Gartner 1866; Skala 1912–1913), but no subsequent records are known from Brno or its surroundings. In the Czech part of Silesia, Maximilian F. Wocke first reported the species in 1882 from the mountains west of Krnov (= Jägerndorf) (Wocke 1884a, b); he noted that it occurred there in large numbers (cf. Nagel 1898). Skala (1923) incorporated these data and added a record from nearby Opava (= Troppau), and Skala (1931) later extended the overview to include the Hrubý Jeseník Mts. (the lower valleys of ‚Altvatergebiet'). Most of these historical records are imprecise and date from the turn of the 19th and 20th century at the latest.

There are no post-war reports from Czech Silesia. In Moravia, the species was discovered in the Bílé Karpaty Mts. (Králíček 1981), and these records are summarised by Králíček & Gottwald (1987). Notable localities include Horní Němčí (Lesná), Javorník (Filipovické údolí), Kněždub, Radějov and Velká nad Veličkou (Králíček & Gottwald 1987), as well as Suchov (AOPK ČR 2025). Recent records have been documented only from the Machová Nature Reserve and from the cadastral areas of the villages Vápenky (J. Uřičář, *pers. comm*.) and Nová Lhota (M. Zapletal, *pers. comm*.).

Distribution in the Polish part of Silesia

In Poland, *I. roraria* occurs very locally in upland areas, as well as in the foothills and at lower altitudes (Malkiewicz 2012). The earliest records of *I. roraria* from Polish Silesia date to the second half of the 19th century, specifically from Głucholazy (= Ziegenhals; Wocke 1884b; cf. Nagel 1897; Skala 1931; Raebel & Toll 1962) and Prudnik (= Neustadt) (Nagel 1897; Wolf & Raebel 1913). A record from Ligotka Dolna dates to the mid-20th century (Raebel & Toll 1962).

After 1990 the species was reported again in the Opava Mountains, in the vicinity of Pokrzywna and Jarnołtówek, as well as in Dębowce, Prudnik (Blaik 2003), Wieszyna (near Nowa Wieś), Krasne Pole, Hraniczny Wierch, and Mokre-Kolonia (Blaik 2011).

It can therefore be concluded that the first Silesian records of *I. roraria* originate in the late 19th century (Krnov, Głuchołazy, Prudnik), mainly due to the activities of regional entomologists associated with the *Verein für schlesische Insektenkunde zu Breslau*. These records were later incorporated into the compendia of Skala (1912–1913, 1923, 1931) and Wolf & Raebel (1913). However, most historical faunistic records are imprecisely localised and undated. Throughout much of the 20th century only a few records were reported from Polish Silesia; this changed after 1990, when *I. roraria* was recorded at several localised in the border area of the Opava Mountains (Blaik 2003, 2011). No further records are known from Czech Silesia after 1882 (Wocke 1884a).

Results and discussion

Here we present a new record of *Isturgia roraria* from the Czech part of Silesia:

Dívčí Hrad, Bruntál (5771b), 17.vi.2025, 2♂♂, 2♀♀, (+ 3 ex. observed), T. Kuras leg. et coll. (Fig. 1)
Note: Helena Game Reserve (50°16’11”N 17°37’36”E), 340 m a.s.l., edge of a forest road with adjacent dense *Cytisus scoparius* vegetation (Fig. 2).

The record from the vicinity of the village of Dívčí Hrad confirms the occurrence of *I. roraria* in Czech Silesia after more than 100 years. It also represents the only additional area of occurrence of the species in Czechia. Currently, *I. roraria* occurs in two disjunct areas in Czechia: the Bílé Karpaty Mts. and Silesia. These areas are isolated from each other, and the populations within them are probably also isolated.

The two populations appear to be ecologically distinct because they use different host plants. The Bílé Karpaty Mts. population is trophically associated with *Genista tinctoria* L., whereas the Silesian population is associated with *Cytisus scoparius* (L.) Link (Blaik 2003; Králíček 1981). The difference in larval feeding specialisation is likely due to the substantially lower abundance of *C. scoparius* in the Bílé Karpaty Mts. (Kaplan et al. 2021). Given the differing ecologies of the host plants, the species is therefore expected to occupy different habitat types in Silesia versus the Bílé Karpaty Mts. In the Bílé Karpaty Mts.s, *I. roraria* inhabits dry grasslands of the Festuco-Brometea (Br.-Bl. & Tüxen ex Soó 1947) with abundant *G. tinctoria* (usually at the margins of oak forests). In Silesia, it occurs in ruderal vegetation overgrowing forest clearings, forest edges, clear-cuts, abandoned pastures, etc., where *C. scoparius* is dominant (cf. Blaik 2011).

Fig. 2: Habitat of *Isturgia roraria* in the Dívčí Hrad cadastral area — a forest road in the Helena Game Reserve, with abundant *Cytisus scoparius* along the road edges, 17 June 2025. Photo by T. Kuras.

Both Czech populations of *I. roraria* are presently threatened. The population in the Bílé Karpaty Mts. appears to be declining (cf. Králíček & Gottwald 1987) and has recently been recorded from only three localities: the Machová Nature Reserve and the vicinity of Vápenky and Nová Lhota. Threats include population isolation and unsuitable mowing regimes of the meadows in the Bílé Karpaty Mts.. Regular mowing removes or damages stands of *G. tinctoria*, substantially reducing larval survival (J. Uřičář, *pers. comm*.). A similar mowing regime is thought to have caused the local extinction of *Colias myrmidone* (Esper, 1781) at the same sites in the beginning of the millennium (Konvička et al. 2008).

The conservation status of the Silesian population is unknown. Although the species has long been known from the region (see Wocke 1884a, b; Nagel 1897), its recent occurrence has only been confirmed in the last decades from several localities (Blaik 2003, 2011). The isolation of these localities increases the species' vulnerability. However, the outlook for the Silesian population is comparatively more favorable because C. *scoparius* – a neophyte – has been expanding in recent decades, a process accelerated by climate change (especially milder winters; Thomas et al. 2025).

The Silesian population of *I. roraria* has been recorded at several localities in Poland but only at one in Czechia (Fig. 3). Most recent records originate mainly from the northern and eastern parts of the Zlaté Hory Highlands (= Zlatohorská vrchovina, Góry Opawskie) (Demek & Mackovčin 2014). Altitudes of localities in the Czech-Polish border area range from

approximately 300 to 450 m a.s.l. (median 350 m). Given the current and historical distribution in this area (Wocke 1884a, b; Nagel 1897), additional localities of *I. roraria* are likely to be discovered. Occurrence can be expected mainly in the area defined by the settlements of Janov, Jindřichov, Krnov, Město Albrechtice and Slezské Rudoltice.

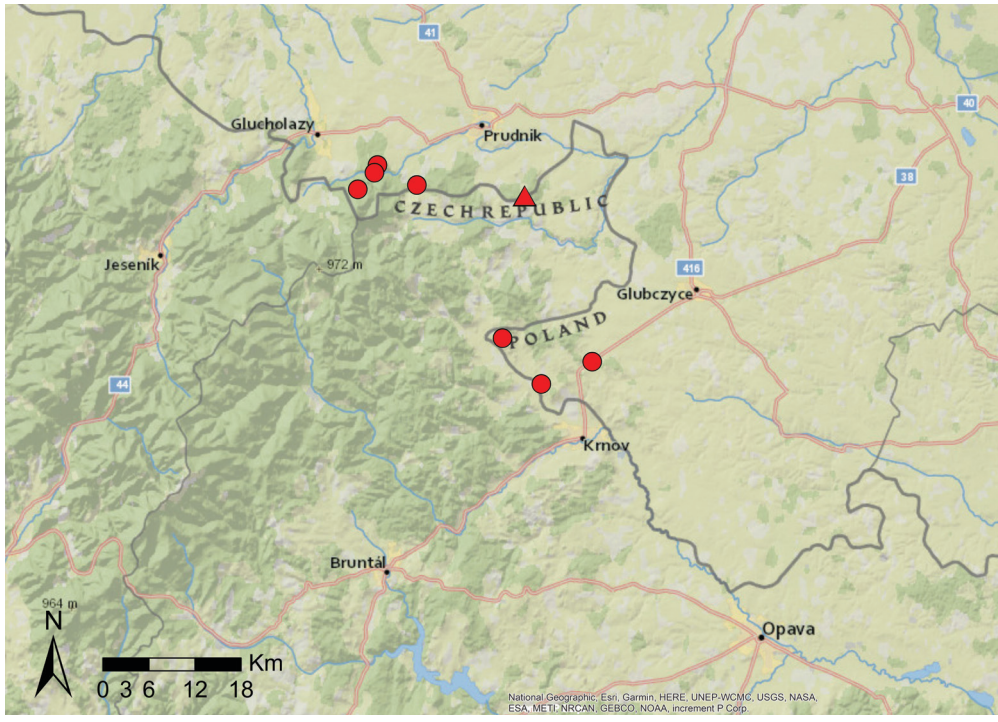

Fig. 3: Map of the recent (since 1990) distribution of *Isturgia roraria* (Fabr.) in Silesia (Czech–Polish border region). Symbols: ▲ – record from Dívčí Hrad; ● – published records (Blaik 2003, 2011).

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