

## Interesting lichen records from Králický Sněžník Mts. (Glatzer Schneeberg, Czech Republic)

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**Abstract** – The most important results of a lichenological survey carried out in 2001-2005 in Králický Sněžník are presented. Historical data on occurrence of lichens recently rare in the Czech Republic (viz *Biatora helvola*, *Cyphelium inquinans*, *Eiglera flavida*, *Lobaria pulmonaria*, *Nephroma parile*, *Psoroma hypnorum*, *Sphaerophorus fragilis* and *Strigula stigmatella*) were verified in the field. Several species were not recorded in the territory so far (viz *Agonimia repleta*, *Japewia subaurifera*, *Lecania furfuracea*, *Lecidea leprarioides*, *Leptogium subtile*, *Pyrenula nitida* and *Sclerophora peronella*). Totally, entries on 355 lichen species were gathered up till now. The number is equal to ca 27% of complete national lichen-flora (including historical and bibliographical data). During the current survey 231 species were recorded.

**Key words** – lichenized fungi, phytogeography, floristic research

### Introduction

Králický Sněžník Mts. is the second highest (1423 m a.s.l.) and the smallest mountain range of the Czech Republic (76 km<sup>2</sup>). The smaller part extends to Poland, where it is called Śnieżnik. Spruce timber-line is not followed by natural dwarf pine belt here; dwarf pines used to be planted in some places in past (e.g. Malý Sněžník, Podbělka) [Šafář et al. 2003]. Due to hard climatic conditions the summit landscape recalls Nordic tundra. It is dominated by a central cone landform with several projecting continuous crests („Mokrý hřbet“ is the largest one). The summit is formed by a system of terrain steps with extensive boulder fields (the most extensive one is „pod Vlačstovčími kameny“, where the rock was disintegrated by freeze thaw events). The predominating types of rock are those of acidic character (e.g. metamorphic rocks – gneiss, migmatites). Locally they contain insertions of crystalline limestone and dolomite, visible e.g. in upper part of the valley of the Morava („Tvarožné díry“) or around the large cave Medvědí jeskyně on Polish side (Gawlikowska & Opletal 1997).

There is a lot of references on the occurrence of sensitive epiphytic lichens in Králický Sněžník Mts. dating back to the mid of 19<sup>th</sup> century, which were not con-

firmed recently, e.g. *Gyalecta ulmi*, *Menegazzia terebrata*, *Nephroma resupinatum*, *Pyrenula laevigata* (probably collected on the Polish side), *Sphaerophorus globosus*, *Usnea longissima* (e.g. Flotow 1850, Körber 1855, Stein 1879, Eitner 1896, 1901, 1911, Paul 1906, Kovář 1911, Servít 1911, Hruby 1914, Müller 1951, Klement 1956 and Vězda 1960, 1961). The majority of the species is ecologically confined to primeval forests, which are available only within small fragments these days.

## Materials and methods

The Czech part of the mountains was investigated, the Polish part (Śnieżnik Kłodzki, Gory Bialske) is being worked out by K. Szczepanska (Fałtynowicz, pers. com.). The localities were georeferenced by standard GPS receiver, thus all the collections are defined by WGS 84 coordinates. Herbarium specimens are kept in the collection of the Museum and gallery of Orlické hory (MGOH). The nomenclature corresponds to that of Santesson et al. (2004).

## Results

The most interesting records were collected at the following sites:

**i) Arctic-alpine and boreo-montane lichens:** a scree under the summit of Sněžník Mt. (*Alectoria ochroleuca*, *Brodoa intestiniformis*, *Ophioparma ventosa*, *Sphaerophorus fragilis*) and a scree „pod Vlaštovčími skalami“ (*Cladonia bellidiflora*, *C. macrophylla*). Other arctic-alpine elements e.g. *Thamnomia vermicularis*, *Frutidella caesioatra* and *Stereocaulon alpinum* (Kovář 1911) were not confirmed now.

**ii) Lichens of spruce forests:** fragments of primeval montane spruce forests „Mokřý hřbet“ and a forest between the tourist bases Sněžná and Franciska (*Bryoria fuscescens*, *Calicium glaucellum*, *Cyphelium inquinans*, *Japewia subaurifera*, *Lecania furfuracea*, *Lecanora subintricata*, *Lecidea leprarioides*, *Mycoblastus sanguinarius*, *Usnea filipendula*). These are surviving fragments of natural forests, where still in the fifties of 20th century A. Vězda collected e.g. *Bryoria bicolor*, *Hypogymnia vittata* or *Sphaerophorus globosus* (Vězda 1960). In higher altitudes rowan trees are intermixed, rarely sheltering *Biatora helvola*.

**iii) Epiphytic lichens of ravine and old-growth forest species:** still lichenologically interesting is the valley (glacial cirque) of the Morava, overgrown with rowans and sycamores. Due to the forests covering the surrounding slopes it does not dry out too much during summer thus sustaining suitable climatic conditions for several susceptible epiphytes (e.g. *Agonimia repleta*, *Nephroma parile* and *Strigula stigmatella*). Fragments of well preserved beech-fir forests (e.g. „Na Strašidlech“) host occasionally further rare epiphytes requiring old trees and primeval forest climate, e.g.

*Chaenotheca brachypoda*, *Lobaria pulmonaria*, *Sclerophora peronella*). Several significant species, however, were not confirmed now e.g. *Gyalecta ulmi* and *Mycobilimbia carneoalbida* (Vězda 1960).

iv) **Lichens on limestone:** limestone outcrops are very rare on Králický Sněžník Mts. Thus, all of these biotopes are significant, e.g. „Tvarožné díry“ in the valley of the Morava. Even though the rock surface is mostly shaded by the trees, one can record several lichens lacking elsewhere within the studied area (e.g. *Collema* cf. *fuscovirens*, *Leptogium subtile*, *Polyblastia albida*, *P. dermatodes*, *Psoroma hypnorum*, *Solorina saccata*). Rare species e.g. *Biatorella germanica* and *Thelidium olivaceum* (Kovář 1911) were not confirmed recently.

## Remarkable species

### *Agonimia repleta*

An obligatory epiphytic species described recently (Czarnota & Coppins 2000), rarely saxicolous or epibryophytic, having a few localities in the Czech Republic: Orlické hory Mts. (Halda 2001, Vězda 2000), Šumava Mts. (Palice 1999 as *A. allobata*, cf. Palice et al. 2003), Předšumaví Mts. (Vondrák & Palice 2004), and Jeseníky Mts. (Palice pers. com.). Apparently overlooked.

**SPECIMEN EXAMINED:** Horní Morava, 800 m downwards the spring of the Morava N 50°12'02.89"/ E 16°50'39.46", on exposed roots of *Acer pseudoplatanus*, 900 m a. s. l., leg. J. Halda, 2001/05/23, JPH/4969).

### *Biatora helvola*

An epiphyte confined to the bark of young hardwood and softwood trees in higher altitudes with long lasting snow cover (Printzen 1995). In the Czech Republic recently collected only in Šumava Mts. (Printzen & Palice 1999).

**SPECIMEN EXAMINED:** Horní Morava, Sušina Mt., N 50°12'14.96"/ E 16°50'24.80", spruce forest, *Sorbus aucuparia*, 1295 m a. s. l., leg. J. Halda & M. Zmrhalová, 2004/09/09, JPH/6153).

### *Cyphelium inquinans*

A rare montane epiphyte usually restricted to old growth forests. It survives on an old, dead spruce tree. At a very closely situated locality (Sušina) also *Sphaerophorus globosus* was recorded (Vězda 1960), however it was not confirmed during current research and it is highly probable that the species is locally extinct here (recently known only from Šumava Mts. – Liška et al. 1996, Peksa 2004).

**SPECIMEN EXAMINED:** Horní Morava, N 50°12'00.67"/ E 16°51'20.58", spruce forest between Sněžná and Franciska, 1248 m a. s. l., leg. J. Halda, 2005/07/02, JPH/6476).

### *Eiglera flavida*

A species occurring throughout Europe usually on basic substrates (Nimis 1993, Wirth 1995). Eitner (1896) reported it from „Vlašťovčí skály“, a site however was not specified. Kuťák collected the species on argillite rock between Hlavňov and Hvězda (Kuťák 1923a, b, 1927 – probably old argillite quarry by the road, today covered with vegetation and the species was not confirmed there). Its occurrence on anthropogenic sites is not necessarily exceptional. *E. flavida* was not reported from the Czech Republic recently.

**SPECIMEN EXAMINED:** Horní Morava, Malý Sněžník, N 50°11'27.82"/ E 16°49'07.21", on concrete guard stone, 1290 m a. s. l., leg. J. Halda, 2005/07/01, JPH/6522.

### *Japewia subaurifera*

A rare montane epiphyte, reported so far from montane spruce forests of Šumava Mts. (Palice 1999), not long ago found relatively frequent also in inversion positions on deciduous trees in National Park České Švýcarsko (Palice pers. com.).

**SPECIMEN EXAMINED:** Horní Morava, N 50°12'00.67"/ E 16°51'20.58", spruce forest between Sněžná and Franciska, on dead spruce with *Cyphelium iquinans* and *Lecanora subintricata*, 1248 m a. s. l., leg. J. Halda, 2005/07/02, JPH/6476).

### *Lecania furfuracea*

A species with similar ecological requirements as *Japewia subaurifera*. So far recorded only in Šumava Mts. (Vězda 1999) and Novohradské hory Mts. (Peksa et al. 2004). However, it was collected also in the area of Třeboňsko (S Bohemia) and in Krkonoše Mts. (Palice pers. com.). It is recognized through its finely soresiate green thallus and pale brown apothecia with vanishing margin and 1 to 2-celled spores (Vězda 1999).

**SPECIMEN EXAMINED:** Horní Morava, N 50°12'00.74"/ E 16°51'18.21", spruce forest between Sněžná and Franciska, on old dead spruce, 1220 m a. s. l., leg. J. Halda, M. Zmrhalová, 2005/07/02, JPH/6432).

### *Lecidea leprarioides*

A montane forest species, which was not recorded from the territory of the Czech Republic for a long time (cf. Vězda & Liška 1999). A leprarioid thallus is usually finely soresiate, greyish white to yellowish grey, forming extensive patches. Black apothecia are markedly bluish pruinose. It grows on bark and rarely on wood of conifers (Tønberg 1992). Recently known also in Šumava Mts. and bog woods with *Pinus rotundata* (Palice, pers. com.).

**SPECIMEN EXAMINED:** Horní Morava, N 50°12'00.74"/ E 16°51'18.21", spruce forest between Sněžná and Franciska, on old spruce, 1220 m a. s. l., leg. J. Halda, M. Zmrhalová, 2005/07/02, JPH/6426).

### *Leptogium subtile*

A species recently reported only from Orlické hory Mts. (Halda 1999). The minute species is recognized well according to abundant, round, orange apothecia (Jørgensen 1994).

**SPECIMEN EXAMINED:** Horní Morava, Tvarožné díry, N 50°11'04.32"/ E 16°50'18.67", on plant debris with *Psoroma hypnorum*, 840 m a. s. l., leg. J. Halda, M. Zmrhalová, 2004/09/11, JPH/6220).

### *Lobaria pulmonaria*

A rare forest epiphyte recently given only from several localities in Šumava Mts. and one locality in Novohradské hory Mts. and Králický Sněžník Mts. (Liška et al. 1996), where it was confirmed from the valley of the Morava (Liška & Pišút 1990, Liška et al. 1996 – the same locality was reported by Vězda (1960) for the species *Gyalecta ulmi* – recently not confirmed). The species was cited also by Hruby (1914). The species was not collected directly in the valley of the Morava. Current collection (one large and several smaller thalli) originates in beech-fir forest „Nad Strašidly“ overgrowing a beech tree. Anděl (1999) reported *L. pulmonaria* from the same locality, but growing on *Acer pseudoplatanus*.

**SPECIMEN EXAMINED:** Horní Morava, old growth forest „Ve Strmém“, N 50°11'43.06"/ E 16°49'44.80", *Fagus sylvatica*, 1116 m a. s. l., leg. J. Halda, M. Zmrhalová, 2005/07/02, JPH/6508.

### *Nephroma parile*

A rare epiphyte in the Czech Republic, reported from the base of a sycamore in the valley of the Morava, so far not reported from Králický Sněžník Mts. Recently, the species was recorded only in five localities in Šumava Mts. (Liška et al. 1996) and as an epibryophyte on rocks in Předšumaví Mts. (Vondrák & Palice 2004).

**SPECIMEN EXAMINED:** Horní Morava, 800 m downwards the spring of the Morava, N 50°12'05.72"/ E 16°50'44.73", *Acer pseudoplatanus*, 900 m a. s. l., leg. J. Halda, M. Zmrhalová, 2001/05/23, JPH/4974.

### *Psoroma hypnorum*

A very rare species in the Czech Republic, finally confirmed almost after a hundred years (cf. Kovář 1911). A label of Kovář's historical specimen (1909, OLM) unfortunately does not supply us with detail data on the location. Currently the species grows on bryophytes overgrowing rocks of the wall lining the river at „Tvarožné díry“ along with *Leptogium subtile*.

**SPECIMEN EXAMINED:** Horní Morava, Tvarožné díry, N 50°11'04.32"/ E 16°50'18.67", 840 m a. s. l., leg. J. Halda, M. Zmrhalová, 2000/10/19, JPH/4529.

***Pyrenula nitida***

A rare species confirmed after a long time requiring smooth bark of deciduous trees, mainly beech trees and high air humidity. The locality is not included in the Red data book (Liška & Pišút 1995).

**SPECIMEN EXAMINED:** Horní Morava, old growth forest „Ve Strmém“, N 50°11'44.95"/ E 16°49'48.40", *Fagus sylvatica*, 1116 m a. s. l., leg. J. Halda, M. Zmrhalová, 2005/07/02, JPH/6495.

***Sclerophora peronella***

Number of currently collected specimens does not exceed 15. Most of them originate in Šumava Mts., one in Orlické Hory Mts. and Brdy Mts. (Palice 1998, Halda 1999, Liška et al. 2006), not comprising the presented collection. A rare forest epiphyte confined mostly to old deciduous trees in old growth forests.

**SPECIMEN EXAMINED:** Horní Morava, old growth forest „Ve Strmém“, N 50°11'43.06"/ E 16°49'44.80", in a hollow trunk of *Fagus sylvatica*, 1116 m a. s. l., leg. J. Halda, M. Zmrhalová, 2005/07/02, JPH/6478.

***Sphaerophorus fragilis***

A rare arctic-alpine species recently recorded only in Šumava Mts. and Jeseníky Mts. (Liška & al. 1998). Its occurrence was confirmed also in the area of Králický Sněžník Mt. now. First report on abundant occurrence was given by Körber (1855). Recently, two well developed thalli were found (diam. 4 cm) on a boulder of a scree and one little one on the rock at „Vlaštovčí skály“. Previously it was collected by A. Vězda here in 1957 (herb. OLM).

**SPECIMEN EXAMINED:** Horní Morava, N 50°12'10.36"/ E 16°50'20.25", in the scree below „Vlaštovčí skály“, 1285 m a. s. l., leg. J. Halda, M. Zmrhalová, 2004/06/26, JPH/5864.

***Strigula stigmatella***

Previously recorded by Eitner (1901) on the Polish side of the ridge. Recently given only once from Šumava Mts. (Palice 1999), where it occurs at several localities, but exclusively in the remnants of primeval forests (Palice pers. com.). Sensitive species growing on bark or epiphytic bryophytes, rarely on rocks (cf. Wirth 1995) featuring similar ecological requirements as *Lobaria pulmonaria*. It is apparently extinct in most parts of the country. Currently found on a rowan in the valley of the Morava.

**SPECIMEN EXAMINED:** Horní Morava, 800 m downwards the spring of the Morava, N 50°12'05.72"/ E 16°50'44.73", *Acer pseudoplatanus*, 900 m a. s. l., leg. J. Halda, M. Zmrhalová, 2001/05/23, JPH/4955.

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