

NOTEWORTHY LICHENS, LICHENICOLOUS AND OTHER ALLIED FUNGI RECORDED IN BOHEMIAN KARST, CZECH REPUBLIC

Pozoruhodné lišejníky, lichenikolní houby a jiné lišejníkům podobné houby Českého krasu

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Abstract: 50 taxa of lichenized, lichenicolous and other allied fungi are treated here, of them *Candelariella aurella* f. *smaragdula*, *Catillaria minuta*, *Intralichen baccisporus*, *I. lichenicola*, *Lecanora agardhiana*, *L. rouxii*, *Lepraria nivalis*, *Opegrapha paraxanthodes*, *O. suecica*, *Sclerococcum griseisporodochium*, *Stigmidium psorae*, *Verrucaria beltramiana*, and *V. compacta* are new to the Czech Republic, and *Pyrenocollema saxicola* is new for Bohemia. Another 24 species are new to the Bohemian Karst, Central Bohemia. *Amphisphaeria fallax*, a little-known saprobic non-lichenized fungus is also treated.

Keywords: biodiversity, calcicolous lichens, lichen-forming fungi, Central Bohemia.

Located close to Prague, Bohemian Karst (Český kras) belongs to the areas within the Czech Republic with the best known lichen biodiversity. A valuable lichen checklist of the central part of the Bohemian Karst was recently published (Svoboda 2006). It considers both historical and recent records and contains 290 species. Subsequently, Vondrák & al. (2007) reported *Caloplaca biatorina*, *C. crenulatella*, *C. dichroa*, *C. erodens*, *C. flavocitrina*, *C. inconnexa*, *C. polycarpa*, and *C. thuringiaca* as new to this area. Our article represents another short addition to the diversity of lichens, lichenicolous and other allied fungi in Bohemian Karst based mainly on recent investigations of damp and shaded limestone rocks in deep valleys of the central part of the area. For some species, other records from the Czech Republic are also mentioned.

The Species

! - new to the Czech Republic, * - new to the region of Bohemian Karst, # - lichenicolous fungus

Absconditella lignicola Vězda & Pišút

- Beroun, Srbsko, deep valley of the brook “Bubovický potok” ca 0.5-1.5 km NE of village, alt. 250-300 m, 49°56'50.47"N, 14°9'17.52"E, on wet wood with *Micarea prasina*, 29.4.2006, coll. J. Vondrák (CBFS JV4474).

Acarospora glaucocarpa (Ach.) Körb.

- Beroun, Svatý Jan pod Skalou, ca 200 m W of the village, loc. “Hřebenač”, at edge of steep S-facing slope of high crest, alt. 280 m, 49°58'06.9"N, 14°07' 50.5"E, MTB 6050 B14, on limestone, 1.7.1998, coll. J. Kocourková (PRM 908947).
- Svoboda (2006) treated the species as probably extinct in the Bohemian Karst.

**Acarospora heppii* (Nägeli) Körb. (syn. *Myriospora heppii* (Nägeli ex Körb.) Hue; correct name, see Harris & Knudsen 2006)

- Beroun, Srbsko, on rocks in bottom of deep gorge “Čísařská rokle” ca 600 - 800 m S of village, alt. 230-320 m, on shaded limestone rock, 49°55'38"N, 14°7'46"E, 20.5.2006, coll. J. Vondrák (CBFS JV4419).

**Acrocordia conoidea* (Fr.) Körb.

- Beroun, Srbsko, on rocky outcrops in the valley of the brook “Bubovický potok” ca 0.5-1.5 km NE of the village, alt. 250-300 m, 49°56'50.47"N, 14°9'17.52"E, on damp and shaded limestone rock, 29.4.2006, coll. J. Vondrák (CBFS JV4476, 4478).

**Agonimia opuntiella* (Buschardt & Poelt) Vězda

- Beroun, rocks above the right bank of the river Berounka between the villages of Karlštejn and Srbsko, close to the hill Střevíc, alt. 250-300 m, 49°55'44.43"N, 14°8'48.13"E, on shallow calcareous soil overgrowing *Encalypta vulgaris*, 19.7.2006, coll. J. Vondrák (CBFS JV4796); Beroun, Srbsko, S-exposed rocks in the protected area Koda, ca 1.5 km SW of the village, alt. 300-350 m, 49°56'N, 14°7'E, over *Leucodon sciuroides* on a limestone rock, 23.7.2004, coll. J. Vondrák (CBFS JV2428).

Amphisphaeria fallax De Not.

- Beroun, Srbsko, in open oak forest on S-exposed rocks in protected area Koda ca 1.5 km SW of village, alt. 300-350 m, 49°56'N, 14°08'E, on bark of *Quercus pubescens*, 23.7.2004, coll. J. Vondrák, rev. D. L. Hawksworth (CBFS JV2565, sub *Mycomicrothellia confusa*); Ibid.: 21.5.2006 (CBFS JV4413, sub *Mycomicrothellia confusa*).

This saprobic and hardly recorded species is superficially similar to *Mycomicrothellia confusa*, but is easily distinguished by the unitunicate asci with I+ blue apical ring. The neotype of *A. fallax* was also collected on *Quercus* in Bohemia, Weisskirchen (Bílý Kostelec u Úštěku) (Wang & al. 2004).

**Anaptychia ciliaris* (L.) Körb.

- Beroun, Srbsko, on S-exposed rocks in the protected area Koda ca 1.5 km SW of the village, alt. 300-350 m, 49°56'N, 14°7'E, on the bark of *Quercus pubescens*, 23.7.2004, coll. J. Vondrák (CBFS JV2432).

In Bohemian Karst, the lichen was recently collected at Svätý Jan pod Skalou, coll. Z. Palice (Svoboda 2006).

Anema notarisii (A. Massal.) Forssell

- Beroun, Srbsko, on S-exposed rocks in the protected area Koda ca 1.5 km SW of the village, alt. 300-350 m, 49°56'N, 14°7'E, on overhanged hard limestone rock, 23.7.2004, coll. J. Vondrák, conf. A. Guttová (CBFS JV2600); Ibid., 21.5.2006 (CBFS JV4423).

Anema tumidulum Henssen, nom. ined.

- Beroun, Srbsko, on S-exposed rocks in the protected area Koda ca 1.5 km SW of the village, alt. 300-350 m, 49°56'N, 14°7'E, on overhanging hard limestone rock, 23.7.2004, coll. J. Vondrák, conf. A. Guttová (CBFS JV4301); Ibid., 21.5.2006 (CBFS JV4422).

Bacidia fuscoviridis (Anzi) Lettau

- Beroun, Srbsko, on rocks in the bottom of the deep gorge “Čísařská rokle” c. 600-800 m S of the village, alt. 230-320 m, 49°55'38"N, 14°7'46"E, on wet and shaded limestone rock, 20.5.2006, coll. J. Vondrák (CBFS JV4441, 4442).

Although collected from one locality only, the species was also recorded on shaded limestone rocks at other places in the region: Bubovice, Karlík, Karlštejn, Koda, and Svätý Jan pod Skalou. It usually forms large populations but is rarely fertile. As already suggested by e.g. van den Boom & al. (1994), Wirth (1995) and Guttová & Palice (2001), *B. fuscoviridis* is a rather common even though rarely recorded species on shaded limestone rocks in Europe.

Bacidia herbarum (Stizenb.) Arn.

- Beroun, Svatý Jan pod Skalou – Sedlec, on SE-facing steppe rocky slope, alt. 310 m, on diabase rocks, overgrowing dead bryophytes, 19.10.1989, coll. J. Horáková (PRM 886319).

**Caloplaca stillicidiorum* (Vahl) Lynge

- Beroun, near Hostim, 1.1 km E of the confluence of Loděnice and Berounka rivers, Chlum quarry, near the upper edge of a limestone quarry wall, on a SSW-facing gentle slope, alt. 310 m, 49°56' 49.7" N, 14°08' 03.3"E, on a piece of old bark lying on calcareous soil, 7.6.2006, coll. J. Kocourková (PRM 907188); Beroun, Svatý Jan pod Skalou – Sedlec, on a SE-facing steppe rocky slope, alt. 300 m, on plant debris over diabasic rocks, 15.4.1993, coll. J. Horáková (PRM 907188).

!*Candelariella aurella* f. *smaragdula* Szatala

- Beroun, by the railway track ca 1 km E of Beroun railway station, alt. 230 m, 49°57'30.82"N, 14°5'12.59"E, on a vertical N-exposed concrete wall, 23.7.2004, coll. J. Vondrák (CBFS JV2217).
- Other records from the Czech Republic: South Bohemia. Kaplice, Benešov nad Černou, Ličov, around the village, alt. 600 m, on concrete column, 27.9.2004, coll. J. Vondrák (CBFS JV2322)

**Candelariella medians* (Nyl.) A.L.Sm.

- Beroun, Tmář, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, on limestone rock with *Caloplaca biatorina*, 19.7.2006, coll. J. Vondrák (CBFS JV4835).

!*Catillaria minuta* (A.Massal.) Lettau

- Beroun, Srbsko, rocky outcrops in valley of brook "Bubovický potok" ca 0.5-1.5 km NE of village, alt. 250-300 m, 49°56'50.47"N, 14°9'17.52"E, on shaded limestone rock, 29.4.2006, coll. J. Vondrák (CBFS JV4473).

***Cercidospora solearispora* Calatayud, Nav.Ros. & Hafellner nom. ined.

- Beroun, Srbsko, lower part of S-exposed rocks in the protected area Koda, ca 1.5 km SW of the village, alt. 280-330 m, 49°56'N, 14°7'E, parasitic in apothecia of *Aspicilia contorta* ssp. *hoffmaniana*, 21.5.2006, coll. J. Vondrák (CBFS JV4430).

**Dirina stenhammari* (Stenham.) Poelt & Follm.

- Beroun, Srbsko, lower part of S-exposed rocks in protected area Koda ca 1.5 km SW of village, alt. 280-330 m, 49°56'N, 14°7'E, on light dry limestone underhanging rock, 21.5.2006, coll. J. Vondrák (CBFS JV4427); Beroun, Tmář, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, on vertical calcareous rock, 19.7.2006, coll. J. Vondrák (CBFS JV4838).

In the Czech Republic, the species was known before from only two sites in south Bohemia (Vondrák & Palice 2004, Vondrák 2006).

- Other records from the Czech Republic: West Bohemia. Horažďovice, Žichovice, protected area Čepičná, on SW slope of Chanovec hill, alt. ca 500 m, 49°16'28.93"N, 13°35'30.59"E, on shaded overhanging limestone rock, 17.3.2007, coll. J. Vondrák (CBFS JV5125).

#!*Intralichen lichenicola* (M.S. Christ. & D. Hawksw.) D. Hawksw. & M.S. Cole

- Beroun, concrete wall near the railway station, alt. 230 m, 49°57'30.82"N, 14°5'12.59"E, parasitic on *Candelariella aurella* f. *smaragdula*, 23.7.2004, coll. J. Vondrák (CBFS JV2528); Beroun, Tmář, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, in apothecia of *Toninia subdispersa*, 19.7.2006, coll. J. Vondrák (CBFS JV4897).

#!*Intralichen baccisporus* D. Hawksw. & M.S. Cole

- Beroun, Svatý Jan pod Skalou, ca 200 m W the village, loc. "Hřebenáč", at the edge of a steep S-facing slope above road at cemetery, alt. 280 m, 49°58'06.9"N, 14°07' 50.5"E, MTB 6050 B14, in apothecia of *Caloplaca marmorata*, 1.7.1998, coll. J. Kocourková (PRM 908966).

**Lecania cuprea* (A.Massal.) van den Boom & Coppins

- Beroun, Srbsko, lower part of S-exposed rocks in the protected area Koda, ca 1.5 km SW of the village, alt. 280-330 m, 49°56'N, 14°7'E, on limestone underhang, 21.5.2006, coll. J. Vondrák (CBFS JV4440); Beroun, Svätý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on limestone underhang, 28.4.2006, coll. J. Vondrák (CBFS JV4448).

From the Czech Republic, it was only recorded by Kuřák (1927, sub *Bacidia chlorotica*) in Železné hory Mts, at the ruin Rozpakov close to the village Vápenný Podol.

- Other records from the Czech Republic: South Moravia: Brno, Mokrá-Horákov, on shady calcareous outcrops N of the village, 16.10.2007, coll. J. Kocourková (PRM).

!*Lecanora agardhiana* Ach.

- Beroun, Srbsko, S-exposed rocks in the protected area Koda ca 1.5 km SW of the village, alt. 300-350 m, 49°56'N, 14°7'E, on hard limestone rock, 23.7.2004, coll. J. Vondrák (CBFS JV2604).

This species belongs to the *L. dispersa* group but is superficially rather similar to *Caloplaca albopruinosa* (syn. *C. agardhiana* auct.) or *Rinodina immersa*. There are several intraspecific taxa in *L. agardhiana* (Poelt . 1995), but our specimen cannot be further identified with certainty.

!*Lecanora rouxii* Ekman & Tønsberg (syn. *Lepraria flavescens* Cl.Roux & Tønsberg)

- Beroun, Srbsko, rocks in bottom of deep gorge "Čísařská rokle" c. 600 - 800 m S of village, alt. 230-320 m, 49°55'38"N, 14°7'46"E, on shaded dry limestone underhang, 20.5.2006, coll. J. Vondrák, det. Š. Slavíková-Bayerová (CBFS JV4418, sub *Lepraria nivalis*; atranorin, eugenitol, flavescin, sordidone, unknown substances by TLC)

This species belongs to the *L. rupicola* group (Grube . 2004), but its appearance is rather similar to *Lepraria* species. Before the species was genetically studied by Ekman & Tønsberg (2002), it was considered as a member of the genus *Lepraria* – *L. flavescens* (Clauzade & Roux 1977, Tønsberg 2002). It can be easily mistaken for *Lepraria nivalis* and *L. crassissima*, but they differ in chemistry. It has been reported in a few countries of Europe and in Turkey (e.g. Leuckert . 2004, John . 2000).

- Other records from the Czech Republic: South Bohemia. Blanský les upland, Český Krumlov, Nové Dobrkovice, N-exposed rock S of the village, near the road between Č. Krumlov and Kájov, alt. 496 m, 48°49'01.2"N, 14°17'27.0"E, on shaded limestone rock, 24.3.2005, coll. J. Vondrák, det. Š. Slavíková-Bayerová (CBFS JV2745). East Bohemia. Králický Sněžník National Natural Reserve, in old limestone quarry in Horní Morava, alt. 809 m, 50°09'43,44" N, 16°49'24,33" E, on limestone boulder, together with *Lepraria vouauxii*, 9.7.2005, coll. J. Halda 6455 & M. Zmrhalová, det. Š. Slavíková-Bayerová (hb. J. Halda). South Moravia. Znojmo, Čížov, rock in Dyje river valley, under asphaltic road to Hardegg ca 2 km SSE of Čížov, alt. 325 m, 48°51'17.0"N, 15°52'14.8"E, at base of lime-rich rock, 14.4.2005, coll. J. Vondrák & J. Šoun, det. Š. Slavíková-Bayerová (CBFS JV2882).

**Lempholemma chalazanum* (Ach.) de Lesd.

- Beroun, Tmář, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, on calcareous soil among mosses, 19.7.2006, coll. J. Vondrák (CBFS JV4858).
- Other records from the Czech Republic: Central Bohemia. Beroun, at railway station, alt. 230 m, 49°57'22.67"N, 14°4'28.63"E, on dry sandy soil in railroad, 6.5.2006, coll. J. Vondrák (CBFS JV4279); Ibid., 25.5.2005 (CBFS JV3012 & JV3022); Praha, Divoká Šárka nature reserve, below south-facing slope of Šestákova skála rock, on lydite outcrop, alt. 330 m, 18.11.1993, coll. J. Horáková (PRM 908162); Prokopské údolí valley, Holyně, near Holyňské koupaliště swimming pool, on south-facing slope of calcareous outcrops, 5.5.1994, coll. J. Horáková (PRM 886701). East Bohemia. Choceň, in town, on soil among stones in pathway, 31.7.2005, coll. J. Vondrák (CBFS JV3121). South Bohemia. České Budějovice, at buildings of Faculty of Sciences, on sandy soil, 13.12.2006, coll. J. Vondrák (CBFS JV5652); České Budějovice, Kaliště, in village, on soil in pavement, 17.11.2006, coll. J. Vondrák (CBFS JV4746).

**Lepraria crassissima* (Hue) Lettau

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on W-faced, wet and shaded, overhanging limestone rock in woodland, together with *Lepraria nivalis*, 28.4.2006, coll. J. Vondrák, det. Š. Slavíková-Bayerová (CBFS JV4268); Beroun, Tmáň, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, on vertical-faced calcareous rock, 19.7.2006, coll. J. Vondrák, rev. Š. Slavíková-Bayerová (CBFS JV4827, sub *L. nivalis*).
- Other records from the Czech Republic: Central Bohemia. Křivoklátsko Protected Landscape Area, road between Žloutkovice and Nižbor, along the Berounka river, alt. ca 220 m, on lime-rich schist rock, together with *Lepraria diffusa*, 15.5.1999, coll. Š. Bayerová & al. 3804, det. Š. Slavíková-Bayerová (PRA). Kolín [Kolin Böhmen], together with *Lepraria lobificans* and *L. rigidula*, 1852, coll. Veselsky, det. Š. Slavíková-Bayerová (PRM 851593, sub *Pulveraria farinosa*). South Bohemia. ca 8 km SW of Prachatice, the ruins of the Hus castle above the Blanice river, on vertical side of rock, in fissure, 15.4.2000, coll. Š. Bayerová 4261 & 4262, det. Š. Slavíková-Bayerová (PRA); ca 4.5 km W of Prachatice, the Blanice valley, nature reserve Zábřdská skála, alt. 600 m, on overhanging nutrient-enriched gneiss rock, 5.5.2002, coll. Z. Palice 5909 & J. Vondrák, det. Š. Slavíková-Bayerová (PRA, sub *Lepraria lobificans*); Šumava Mts, Záhvozdí: Mt. Černý les - on the top, on vertical side of rock, 14.4.2000, coll. Š. Bayerová 4249, det. Š. Slavíková-Bayerová (PRA); Český Krumlov, Nové Dobrkovice, N-exposed rock S of village, near road between Č. Krumlov and Kájov, alt. 496 m, 48°49'01.2"N, 14°17'27.0"E, on shaded limestone rock, 17.4.2006, coll. J. Vondrák, det. Š. Slavíková-Bayerová (CBFS JV4305); Bechyně, in surrounding of Dobronice, by the river Lužnice, ca 200 m from Příběnice-podhradí towards Suchomelův Mlýn, alt. 370 m, on rock, together with *Botryolepraria lesdainii*, 7.6.2001, coll. Š. Bayerová 4455, det. Š. Slavíková-Bayerová (PRA). North Bohemia. Děčín, Kyjovské údolí, on forest path in the Křinice river valley, 0.75 km W of Kyjov, on sandstone, alt. ca 390 m, together with *Lepraria toensbergiana*, 24.4.2003, coll. Š. Bayerová 2121, det. Š. Bayerová (PRA). East Bohemia. Trutnov, Krkonoše Mts, Čertova zahrádka on E slope of Mt Studniční hora, alt. 1100 – 1250 m, in rock fissure, 27.7.2000, coll. Š. Bayerová 1813, det. Š. Bayerová (PRA). South Moravia. CHKO Moravský kras (The Moravian Karst Protected Landscape Area), NE of Adamov, in the Křtinský potok brook valley, Býčí skála National Natural Reserve, alt. ca 350 m, on limestone, 1.7.2007, coll. Š. Slavíková-Bayerová 4643 & M. Slavík, det. Š. Slavíková-Bayerová (PRA); *ibid.*, SE of Ochoz u Brna, by green marked path from Hádek to the Ochozská cave, ca 400 m NE of the cave, alt. 346 m, 49°14'51,2"N, 16°45'07,5"E, on half shaded limestone rock, 10.7.2005, coll. Š. Slavíková-Bayerová 3957, 3958 & M. Slavík, det. Š. Slavíková-Bayerová (PRA); CHKO Pálava (Pálava Protected Landscape Area), Děvín - Kotel - Soutěska National Natural Reserve, by red marked path ca 700 m SW of the hill Děvín, alt. 456 m, WGS-84: 48°51'53,5"N, 16°38'40,1"E, over moss and on shaded limestone rock, 10.7.2005, coll. Š. Slavíková-Bayerová 3983, 3984 & M. Slavík, det. Š. Slavíková-Bayerová (PRA). North Moravia. Hostýnské vrchy nature park, N part of the Smrdutá nature reserve, ca 25 m NE of the hilltop, alt. 738.4 m, 49°22'28.04"N, 17°45'24.78"E, on sandstone boulder, together with *Lepraria vouauxii*, 17.8.2003, coll. Š. Bayerová 2934 & M. Slavík, det. Š. Slavíková-Bayerová (PRA).

!*Lepraria nivalis* J.R.Laundon

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on W-faced, wet and shaded, overhanging limestone rock in woodland, together with *L. crassissima*, 28.4.2006, coll. J. Vondrák, det. Š. Slavíková-Bayerová (CBFS 4980; atranorin, protocetraric acid and two unidentified phenolic substances [trace] by TLC).

This species is known from North America, Europe and Asia (e.g. John . 2000, Laundon 1992). It is widespread in Europe, being quite common in the Mediterranean region (Baruffo . 2006). The thallus is rosette-forming to irregular, sometimes wrinkled and folded and ± loose from the substratum (Tønnsberg 2004). Six chemotypes have been distinguished (Leuckert . 1995, 2004), and the Czech specimens represent chemotype I containing atranorin and protocetraric acid. The species can be easily mistaken for *L. lobificans* and *L. crassissima*, which are morphologically similar (Leuckert . 1995). However, their chemistry is different (Leuckert . 1995, van den Boom . 1994).

- Other records from the Czech Republic: South Bohemia. Český Krumlov, Nové Dobrkovice, protected area "Vyšenské kopce", alt. ca 500 m, on shaded overhanging limestone rock, 24.3.2005, coll. J. Vondrák, det. Š. Slavíková-Bayerová (CBFS JV4981, sub *Lepraria rigidula*).

**Lepraria vouauxii* (Hue) R.C.Harris

- Beroun, Svatý Jan pod Skalou, at top of conspicuous rock above village, alt. ca 350 m, 49°58'14.86"N, 14°8'14.44"E, on shaded vertical calcareous rock, together with *Opegrapha varia*, 19.7.2006, coll. J. Vondrák, det. Š. Slavíková-Bayerová (CBFS JV4850, sub *L. lobificans*; pannaric acid 6-methylester, 4-oxypannaric acid 6-methylester [trace] by TLC).

#**Lichenocodium erodens* M.S.Christ. & D.Hawksw.

- Beroun, Srbsko, 0.5 km S of village, at road going to Karlštejn village, alt. 225 m, on humus over calcareous rock, on *Cladonia pocillum*, 2.5.2001 (PRM 896010); Beroun, Svatý Jan pod Skalou – Sedlec, on SE-facing steppe rocky slope, alt. 300 m, MTB 6050 B, on diabase rocks, on thallus of *Xanthoparmelia somloënsis*, 25.9.1998, coll. J. Kocourková (PRM 760657).

Lichinella nigritella (Lettau) P.Moreno & Egea

- Beroun, Srbsko, lower part of S-exposed rocks in protected area Koda ca 1.5 km SW of village, alt. 280-330 m, 49°56'N, 14°7'E, on light dry limestone overhanging rock, 21.5.2006, coll. J. Vondrák (CBFS JV4425); Beroun, Tmáň, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, on calcareous rock and also on calcareous soil with *Lempholemma chalazanum*, 19.7.2006, coll. J. Vondrák (CBFS JV4857).

#**Muellerella erratica* (A.Massal.) Hafellner & V.John (syn. *Muellerella pygmaea* var. *athallina* (Müll.Arg.) Triebel)

- Beroun, Svatý Jan pod Skalou, above village, locality "Hřebenáč", at edge of steep S-facing slope of high crest above cemetery, alt. 280 m, 49°58'06.9"N, 14°07' 50.5"E, MTB 6050 B14, on *Lobothalia radiosa* growing on limestone, 1.7.1998, coll. J. Kocourková (PRM 908926).

This species was previously published from several localities in Bohemia and Moravia under the name *M. pygmaea* var. *athallina* (Müll.Arg.) Triebel.

**Opegrapha dolomitica* (Arnold) Torrente & Egea

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on W-faced limestone rocks, in wet and shaded overhanging rock in woodland, 28.4.2006, coll. J. Vondrák, conf. L. Sparrius (CBFS JV4270).

!*Opegrapha paraxanthodes* Nyl.

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on W-faced limestone rocks, in wet and shaded overhanging rock in woodland, 28.4.2006, coll. J. Vondrák (CBFS JV 4271, 4272, 4273, 4928).

Our samples from Bohemian Karst entirely fit the description of *O. paraxanthodes* in Pentecost & James (1992), but the distinction between *O. paraxanthodes* and other saxicolous species of the *O. varia* group is still unclear.

!*Opegrapha suecica* Källsten ex Thor

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on W-faced limestone rocks, in wet and shaded overhanging rock in woodland, 28.4.2006, coll. J. Vondrák, det. L. Sparrius (CBFS JV4267).

The distribution of *O. suecica* is still very little known, and so far it is also known from Germany and Sweden (Thor 2004), and Hungary (Vondrák & Šoun, unpublished data).

**Opegrapha vermicellifera* (Kunze) J.R.Laundon

- Beroun, 1 km E of Hostim, valley of Loděnice brook, alt. 260 m, on bark of *Acer platanoides*, 16.4.1999, coll. J. Kocourková (PRM 908953); Beroun, Srbsko, rocky outcrops in valley of brook "Bubovický potok" ca 0.5-1.5 km NE of village, alt. 250-300 m, 49°56'50.47"N, 14°9'17.52"E, on hardwood bark in damp conditions, 29.4.2006, coll. J. Vondrák (CBFS JV4479).

**Petractis hypoleuca* (Ach.) Vězda

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on W-faced damp and shaded overhanging limestone rock in woodland, 28.4.2006, coll. J. Vondrák (CBFS JV4264).

According to Vězda (1965), the species is also known from Moravia: Moravský kras karst, Pavlovské vrchy hills, and Hardegg at Znojmo.

- Other record from the Czech Republic: CHKO Moravský kras, Vilémovice, Balcarova skála-Vintoky nature reserve, Vintoky hill, on top of hill, on vertical face of shady calcareous low outcrops, MTB 6666 B11, alt. 500 m, 6.9.2005, coll. J. Kocourková (PRM 908095).

**Pyrenocollema saxicola* (A.Massal.) Coppins

- Beroun, Srbsko, 0.5 km S of village, at road to Karlštejn village, on limestone rocks, alt. 230 m, MTB 6050 D, 2.5.2001, coll. J. Kocourková (PRM 908970); Beroun, Svatý Jan pod Skalou, above village, locality "Hřeběnáč", at edge of steep S-facing slope of high crest above cemetery, alt. 280 m, 49°58'06.9"N, 14°07'50.5"E, MTB 6050 B14, on limestone, 1.7.1998, coll. J. Kocourková (PRM 908945).

New for Bohemia. Previously the species was reported only from the Moravian Karst near loc. Býčí skála (Suza 1922).

**Rinodina zwackhiana* (Kremp.) Körb.

- Beroun, Srbsko, lower part of S-exposed rocks in protected area Koda ca 1.5 km SW of village, alt. 280-330 m, 49°56'N, 14°7'E, on vertical limestone rock with *Lecania* sp., *Lecanora dispersa*, and *Rinodina calcarea*, 21.5.2006, coll. J. Vondrák (CBFS JV4438).

#!*Sclerococcum griseisporodochium* Etayo

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'51"N, 14°7'51"E, on W-faced limestone rocks, parasitic on *Opegrapha paraxanthodes*, on wet and shaded overhanging rock in woodland, 28.4.2006, coll. J. Vondrák, det. L.B. Sparrius (CBFS JV4266, dupl. hb. Sparrius, JV4270, 4273).

This hyphomycete produces soralia-like sporodochia on its host lichen, usually *Opegrapha paraxanthodes*, and was known before only from the Pyrenees (Etayo 1995) and Italy (Tretiach 2004).

- Other records from the Czech Republic: South Bohemia. Český Krumlov, in valley of river Polečnice at W edge of town, parasitic on *Opegrapha* sp. on shaded NW-facing limestone overhanging rock, 17.4.2006, coll. J. Vondrák (CBFS JV4265); Český Krumlov, Nové Dobrkovice, protected area Vyšenské kopce, in the valley of the brook Hučnice, alt. 490 m, 48°49'10.77"N, 14°17'42.01"E, parasitic on *Opegrapha* sp. on overhanging NW-exposed limestone rock, 3.4.2006, coll. J. Vondrák (CBFS JV3305, 4251, dupl. hb. Sparrius).

**Staurothele rufa* (A.Massal.) Zschacke

- Beroun, Srbsko, lower part of S-exposed rocks in protected area Koda ca 1.5 km SW of village, alt. 280-330 m, 49°56'N, 14°7'E, on light dry limestone underhang with *Anema notarisii*, *A. tumidulum*, and *Lichinella nigritella*, 21.5.2006, coll. J. Vondrák (CBFS JV4421).

Only one record was published from the Czech Republic: Prague, coll. Servít (Zschacke 1934).

**Steinia geophana* (Nyl.) Stein

- Beroun, Svatý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'53"N, 14°7'49"E, on wet wood, 28.4.2006, coll. J. Vondrák (CBFS JV4446). Beroun, Svatý Jan p. Skalou, "Na Herinkách", in beech forest, alt. 400 m, on bank of forest path, 13.9.1989, coll. J. Horáková (PRM 890419).
- Other record from the Czech Republic: Central Bohemia. Rakovník, SW of town, "Příčina" quarry, alt. 370 m, on soil among bryophytes, 31.5.1997, coll. J. Kocourková (PRM 890848). South Bohemia. Český Krumlov, Domoradice, locality Sedm Špicí, in valley of river Vltava, on wet fallen wood near water, 7.4.2006, coll. J. Vondrák (CBFS JV4297).

##**Stigmidium neofusceliae* Calatayud & Triebel

- Beroun, Svätý Jan pod Skalou – Sedlec, on SE-facing steppe rocky slope, alt. 300 m, MTB 6050 B, on diabasic rock, on thallus of *Xanthoparmelia verruculifera*, 15.4.1993, coll. J. Horáková (PRM 760657). New to Bohemia.

!*Stigmidium psorae* (Anzi) Hafellner

- Beroun, near Hostim, 1.1 km E of confluence of Loděnice and Berounka River, Chlum quarry, near upper edge of limestone quarry on SSW-facing gentle slope, alt. 310 m, 49°56' 49.7"N, 14°08' 03.3"E, on calcareous soil, on thallus of *Psora decipiens*, 7.6.2006, coll. J. Kocourková (PRM 908778).

**Strangospora ochrophora* (Nyl.) J.R.Anderson (syn. *Piccolia ochrophora* (Nyl.) Hafellner; correct name, see Hafellner 2004)

- Beroun, Srbsko, in protected area Koda ca 1.5 km SW of village, alt. 280-330 m, 49°56'N, 14°7'E, on bark of *Sambucus*, 21.5.2006, coll. J. Vondrák (CBFS JV4437).
- Other records from the Czech Republic: South Bohemia. České Budějovice, park Stromovka (CBFS JV4656); Netolice (CBFS JV4244); Prachatice, Záblatí (CBFS JV2283); Vimperk, Onšovice (CBFS JV1535, JV1536, JV1617). Central Bohemia. Rakovník, Nezabudice (CBFS JV4579). South Moravia. Brno, Mokrá, "Sivický les" forest, on *Quercus petraea* influenced by calcareous dust (PRM 908783). Except of the Moravian collection, all other records are from *Sambucus* shrubs.

**Thelenella muscorum* (Fr.) Vain. var. *muscorum* (syn. *Chromatochlamys muscorum* (Fr.) H. Mayrhofer & Poelt)

- Beroun, Srbsko, rocks in deep gorge "Císařská rokle" c. 600 - 800 m S of village, alt. 230-320 m, 49°55'53.11"N, 14°7'56.06"E, over mosses in sun-exposed limestone outcrop, 20.5.2006, coll. J. Vondrák (CBFS JV4417, rev. O. Breuss).

In the Czech Republic, it was only known from Krkonoše Mts (Prostřední Lanov), Beskydy Mts (on beech bark at Mt Radhošť), and from western Moravia (on serpentinite at Rožná and on limestone outcrop "Drásovský kopeček" at Tišnov) (Vězda 1959, 1961).

**Thelocarpon epibolum* Nyl.

- Beroun, Svätý Jan pod Skalou, rocks in valley of brook Loděnice S of village, above road to Hostim, alt. 230 m, 49°57'53"N, 14°7'49"E, on wet wood, 28.4.2006, coll. J. Vondrák (CBFS JV4445).

Toninia athallina (Hepp) Timdal

- Beroun, Svätý Jan pod Skalou, above village, locality "Hřebenáč", at edge of steep S-facing slope of high crest above cemetery, alt. 280 m, 49°58'06.9"N, 14°07'50.5"E, MTB 6050 B14, on limestone, 1.7.1998, coll. J. Kocourková (PRM 908946).

The latest previous record from the area was made by Servít in 1930.

**Toninia diffracta* (A.Massal.) Zahlbr.

- Beroun, Srbsko, S-exposed rocks in the protected area Koda ca 1.5 km SW of the village, alt. 300-350 m, 49°56'N, 14°7'E, in fissures in hard limestone rock, 23.7.2004, coll. J. Vondrák (CBFS JV2476). Beroun, near Hostim and Lištice, on slope between road and Berounka River, on diabasic rock, alt. 260 m, 6050 B23, on detritus, 1.7.1998, coll. J. Kocourková (PRM 908871).

**Toninia physaroides* (Opiz) Zahlbr.

- Beroun, near Hostim, 1.1 km E of confluence of Loděnice and Berounka River, Chlum quarry, near upper edge of limestone quarry on SSW-facing place, alt. 310 m, 49°56' 49.7" N, 14°08' 03.3"E, MTB 6050 B14, on calcareous soil, 7.6.2006, coll. J. Kocourková (PRM 908777).

##**Toninia subdispersa* (Nyl. ex Hasse) K.Knudsen (syn. *Toninia talparum* Timdal)

- Beroun, Tmář, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, on sun-exposed limestone rock, affecting thallus of *Lecania cf. inundata*, 19.7.2006, coll. J. Vondrák (CBFS JV4895).

This species was reported from Europe for the first time by Kocourková & van den Boom (2005, sub *T. talparum*). The new combination *T. subdispersa* recently replaced the former name (Knudsen & Lenderemer 2007).

!*Verrucaria beltraminiana* (A.Massal.) Trevis.

- Beroun, Srbsko, lower part of S-exposed rocks in protected area Koda ca 1.5 km SW of village, alt. 280-330 m, 49°56'N, 14°7'E, on limestone rock, 21.5.2006, coll. J. Vondrák, det. O. Breuss (CBFS JV1529); Beroun, Tmáň, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, on calcareous rock, 19.7.2006, coll. J. Vondrák, det. O. Breuss (CBFS JV4802).

This species is similar to *Verrucaria lecideoides*, but differs in having larger ascospores and perithecia (in our sample, spores 17–21 × 7.5–8 µm, and perithecia up to 0.3 mm diam.).

!*Verrucaria compacta* (A.Massal.) Jatta

- Beroun, Svatý Jan pod Skalou, ca 200 m W of village, loc. “Hřebenáč”, at edge of steep S-facing slope of high crest, alt. 300 m, 49°58'06.9"N, 14°07' 50.5"E, MTB 6050 B14, on limestone, 1.7.1998, coll. J. Kocourková (PRM 908950); Beroun, Tmáň, rocks in protected area Kotýz next to limestone quarry Čertovy schody, alt. 300-350 m, 49°54'55"N, 14°2'52"E, on calcareous rock, 19.7.2006, coll. J. Vondrák, conf. O. Breuss (CBFS JV4801).

Souhrn

Náš lichenofloristický příspěvek se zabývá pozoruhodnými lišejníky a lichenikolními houbami nalezenými v posledních letech na území Českého krasu. Příspěvek navazuje na nedávno publikovaný komentovaný seznam lišejníků centrální části Českého krasu a doplňuje jej. Je zde publikováno čtrnáct nových taxonů pro Českou republiku (*Candelariella aurella* f. *smaragdula*, *Catillaria minuta*, *Intralichen baccisporus*, *I. lichenicola*, *Lecanora agardhiana*, *L. rouxii*, *Lepraria nivalis*, *Opegrapha paraxanthodes*, *O. suecica*, *Sclerococcum griseisporodochium*, *Stigmidium psorae*, *Verrucaria beltraminiana* a *V. compacta*) a několik dalších vzácně sbíraných druhů, z nichž 25 je nových pro Český kras.

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References

- Baruffo L., Zedda L., Elix J. A. & Tretiach M. (2006): A revision of the lichen genus *Lepraria* s. lat. in Italy. – *Nova Hedwigia* 83: 387–429.
- Clauzade G. & Roux C. (1977): Taxons nouveaux et intéressants pour le midi de la France. – *Bulletin de la Société Linnéenne de Provence* 30: 9–36.
- Ekman S. & Tønsberg T. (2002): Most species of *Lepraria* and *Leproloma* form a monophyletic group closely related to *Stereocaulon*. – *Mycological Research* 106: 1262–1276.
- Etayo J. (1995): Two new species of lichenicolous fungi from the Pyrenees. – *Nova Hedwigia* 61: 189–197.
- Grube M., Baloch J. & Arup U. (2004): A phylogenetic study of the *Lecanora rupicola* group (*Lecanoraceae*, Ascomycota). – *Mycological Research* 108: 506–514.
- Guttová A. & Palice Z. (2001): Lišajníky Národního parku Muránska planina II – Javorníková dolina [Lichens of the Muránska planina National Park II – Javorníková dolina valley.] – *Výzkum a ochrana přírody Muránskej planiny* 3: 53–68.
- Hafellner J. (2004): A revision of *Maronella laricina* and *Piccolia ochrophora*. – *Symbolae Botanicae Upsalienses* 34: 87–96.
- Harris R. C. & Knudsen K. (2006): The genus *Myriospora*. – *Opuscula Philolichenum* 3: 1–4.
- John V., Seaward M. R. D. & Beatty J. W. (2000): A neglected lichen collection from Turkey: Berkhamsted School Expedition 1971. – *Turkish Journal of Botany* 24: 239–248.
- Knudsen K. & Lendemer J. C. (2007): Changes and Additions to the North American Lichen Mycota – VII. – *Mycotaxon*, in press.

- Kocourková J. & van den Boom P. P. G. (2005): Lichenicolous fungi from the Czech Republic II. *Arthrorhaphis arctoparmeliae* spec. nov. and some new records for the country. – *Herzogia* 18: 23–35.
- Kučák V. (1927): Třetí příspěvek ku květeně českých lišejníků. – *Preslia* 5: 36–51.
- Laundon J. R. (1992): *Lepraria* in the British Isles. – *Lichenologist* 24: 315–350.
- Leuckert Ch., Kümmerling H. & Wirth V. (1995): Chemotaxonomy of *Lepraria* Ach. and *Leproloma* Nyl. ex Crombie, with particular reference to Central Europe. – *Bibliotheca Lichenologica* 58: 245–259.
- Leuckert Ch., Wirth V., Kümmerling H. & Heklau M. (2004): Chemical lichen analyses XIV. *Lepraria nivalis* J. R. Laundon and *Lepraria flavescens* Cl. Roux & Tonsberg. – *Bibliotheca Lichenologica* 88: 393–407.
- Pentecost A. & James P. W. (1992): *Opegrapha*. – In: Purvis O. W., Coppins B. J., Hawksworth D. L., James P. W. & Moore D. M. (eds), *The lichen flora of Great Britain and Ireland*, p. 404–415, Natural History Museum Publications & British Lichen Society, London.
- Poelt J., Leuckert C. & Roux C. (1995): Die Arten der *Lecanora dispersa*-Gruppe (Lichenes, *Lecanoraceae*) auf kalkreichen Gesteinen im Bereich der Ostalpen - Eine Vorstudie. – *Bibliotheca Lichenologica* 58: 289–333.
- Suza J. (1922): Pátý příspěvek k lichenologii Moravy. – *Sborník Klubu přírodovědeckého v Brně* 4: 13–20.
- Svoboda D. (2006): Lišejníky centrální části Českého krasu. [Lichens of the central part of the Bohemian Karst.] – *Novitates Botanicae Universitatis Carolinae* 2006, 18:2 (on line).
- Thor G. (2004): *Opegrapha suecica*, a new lichen from Europe. – *Symbolae Botanicae Upsalienses* 34: 453–454.
- Tønsberg T. (2002): Notes on non-corticolous *Lepraria* s.lat. from Norway. – *Graphis Scripta* 14: 45–51.
- Tønsberg T. (2004): *Lepraria*. – In: Nash T. H. III, Ryan B. D., Diederich P., Gries C. & Bungartz F. (eds.), *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2., p. 322–329, Lichens Unlimited, Arizona State University, Tempe, Arizona.
- Tretiach M. (2004): Further additions to the Italian lichen flora. – *Cryptogamie, Mycologie* 25: 173–183.
- van den Boom P., Brand M., Diederich P., Aptroot A. & Sérusiaux E. (1994): Report of a lichenological field meeting in Luxembourg. – *Bulletin de la Société des Naturalistes Luxembourgeois* 95: 145–176.
- Vězda A. (1959): Lišejníky československých Karpat II. (Výsledky lichenologického výzkumu československých Karpat za rok 1957). [Flechten der tschechoslowakischen Karpaten (II). (Ergebnisse der lichenologischen Durchforschung im tschechoslowakischen Teile der Karpaten im Jahre 1957).] – *Biologia* 14: 86–101.
- Vězda A. (1961): Doplnky k rozšíření lišejníků na Moravě. 3. (Addenda ad lichenographiam Moraviae, III). – *Sborn. Klubu Přírodovědeckého v Brně* 33: 61–69.
- Vězda A. (1965): Flechtensystematische Studien I. Die Gattung *Petractis* Fr.. – *Preslia* 37: 127–143.
- Vondrák J. (2006): Lišejníky chráněného území Vyšenské kopce u Českého Krumlova [Lichen-forming fungi of the protected area Vyšenské kopce near Český Krumlov (South Bohemia)]. – *Bryonora* 37: 9–18.
- Vondrák J., Kocourková J., Palice Z. & Liška J. (2007): New and noteworthy lichens in the Czech Republic - genus *Caloplaca*. – *Preslia* 79: 163–184.
- Vondrák J. & Palice Z. (2004): Lichenologicky významná lokalita Zábrdská skála v Prachatickém Předšumaví. [A lichenologically outstanding locality “Zábrdská skála” in the northern foothills of the Bohemian Forest Mts (Czech Republic).] – *Bryonora* 33: 22–26.
- Wang Y. Z., Aptroot A. & Hyde K. D. (2004): Revision of the Ascomycete genus *Amphisphaeria*. – *Fungal Diversity Press*, Hong Kong. [168 pp.]
- Wirth V. (1995): Die Flechten Baden-Württembergs, Teil 1 & 2. – Ulmer, Stuttgart. [1006 pp.]
- Zschacke H. (1934): Epigloeaceae, Verrucariaceae und Dermatocarpaceae. – In: Rabenhorst's *Krypt.-Fl.*, Band 9, Abt. 1/1, Leipzig, pp. 44–673.