

- Svoboda D., Peksa O. & Veselá J. (2010): Epiphytic lichen diversity in central European oak forests: Assessment of the effects of natural environmental factors and human influences. – *Environmental Pollution* 158: 812–819.
- Trávníčková V. (1992): Floristický výzkum teplomilné vegetace v území severozápadně od Prostějova. – Ms. [Diplomová práce; depon. in: Univerzita Palackého v Olomouci.]

## LICHENS RECORDED DURING THE AUTUMNAL BRYO-LICHENOLOGICAL MEETING IN ŽELEZNÉ HORY MTS (CZECH REPUBLIC), SEPTEMBER 2009

### Lišejníky zaznamenané během podzimního bryologicko-lichenologického setkání v CHKO Železné hory v září 2009

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**Abstract:** 164 lichen-forming fungi and 7 non-lichenized fungi were recorded from the Železné hory Mts (Bohemia). There are a few localities rich in overlooked lichens in the region. We have collected several noteworthy lichen species, e.g. *Calicium pinastri*, *Parmelia ernstiae*, *Porina lectissima*, *P. leptalea*, *Porocyphus coccodes*, *Rhizocarpon badioatrum*, *Staurothele fissa*, and *Verrucaria aethiobola*. *Bacidina caligans* and *Lecidea ahlesii* are new to the Czech Republic.

**Keywords:** biodiversity, epiphytic lichens, freshwater lichens, microlichens

The study area – Železné hory Mts – is situated in Eastern Bohemia, in the northernmost part of the Bohemian-Moravian Highlands (Českomoravská vrchovina), and in 1991 it was declared protected. The first investigations of lichens were performed there by Kalenský (town part Škrovád, Chrudim) and Kuťák (village Vápenný Podol), (Kalenský 1906, Kuťák 1914, 1923, 1927a,b,c). Plenty samples of Verrucariaceae from Vápenný Podol were collected by Kuťák for Servít (Servít 1954), several were also noted by Kocourková (1999). We have visited three nature reserves (Polom, Krkanka and Hrobka) and old limestone quarries close to the Vápenný Podol (cca 500 m).

The Polom Nature Reserve (**PR Polom**) is situated near the Horní Bradlo village. It contains a small remnant of natural old deciduous forest with large *Abies alba* and *Fagus sylvatica* trees, (and *Picea abies*, *Acer pseudoplatanus*). The reserve occupies the area of about 18 ha in altitude 545–624 m. The Krkanka Nature Reserve (**PR Krkanka**) includes deep rocky valley of the Chrudimka River in altitude 346–456 m with water basin bordered by a dam on the west (vodní nádrž Křižanovice I) and by a viaduct on the east. Deciduous trees predominate in this area (*Acer*, *Fagus*, *Carpinus*, *Alnus*). The bedrock is formed by granite. The Hrobka Nature Monument (**PP Hrobka – Škrovád**) is situated in altitude 300–310 m, south of the Slatiňany village (Chrudim). On the right side of the Chrudimka River a large cliff of sandstone was formed.

## List of localities

1. Horní Bradlo, PR Polom, alt. 600–640 m, WGS-84: from N49°47'33.12" E15°45'06.86" to N49°47'25.07" E15°45'09.35", 24. 9. 2009.
- 1a. Ibid., a road side in the village.
2. Nasavrky, PR Krkanka, on the right bank of Chrudimka River, alt. 360 m, WGS-84: from N49°51'22.93" E15°48'10.01" to N49°51'34.87" E15°47'14.47", 25. 9. 2009.
4. Forested brook valley Debrný potok N of Nasavrky, alt. 320 m, WGS-84: N49°51'11.654" E15°47'59.815" to N49°51'28.807" E15°48'10.316", 25. 9. 2009.
5. Old park in Nasavrky, alt. 450 m, WGS-84: N49°51'3.74" E15°47'42.858", 25. 9. 2009.
6. Eastern concrete dam of reservoir Křižanovice, alt. 400 m, WGS-84: N49°51'46.45" E15°46'31.028", 25. 9. 2009.
7. Old limestones quarries close to the Vápenný Podol, alt. 500 m, WGS-84: from N49°53'19.63" E15°39'03.82" to N49°53'24.86" E15°39'08.58", 26. 9. 2009.
8. Brook valley of the Zlatý potok below the Vápenný Podol, alt. 450 m, WGS-84: N49°53'31.429" E15°39'42.921", 26. 9. 2009.
9. Slatiňany, PP Hrobka (Škrovád), sandstone rocks on the right bank of the Chrudimka river, alt. 450 m, WGS-84: N49°54'17.177" E15°48'45.972" to N49°54'10.75" E15°48'52.733", 27. 9. 2009.
10. Krucemburk – Staré Ransko, old protected alley (line of ash and maple trees) between Ranský and Pobočenský rybník pond, alt. 540 m, WGS-84: N49°40'59.250", E15°49'31.063" 27. 9. 2009.

## List of recorded species

The nomenclature follows Liška & Palice (2010), including NE category VU, EN, NT. Non-lichenized fungi similar to lichens are marked by an asterisk (\*). Noted records without voucher specimen are marked by initial letters of the explorers: A. Fessová, F. Bouda, J. P. Halda, J. Kocourková, J. Malíček, A. Müller, O. Peksa, D. Svoboda, J. Šoun (AF, FB, JPH, JK, JM, AM, OP, DS and JS). Collected samples are marked by initial letters of the collectors name and number of specimen or by herbarium code (PRC). The specimens of J. Vondrák and J. Šoun are deposited in the herbarium CBFS, the specimens of O. Peksa in the herbarium PL.

Substrate abbreviations: **Ag** – *Alnus glutinosa*, **Aps** – *Acer pseudoplatanus*, **as** – acid soil, **Bp** – *Betula pendula*, **c** – concrete, **Ca** – *Cerasus avium*, **Cb** – *Carpinus betulus*, **Cl** – *Crataegus laevigata*, **cr** – calcareous rock, **cs** – calcareous soil, **csr** – calcareous sandy rock, **dw** – decaying wood, **Fe** – *Fraxinus excelsior*, **Fs** – *Fagus sylvatica*, **gr** – gneissic rock, **isb** – inundated siliceous boulder, **mb** – mossy boulder, **Qp** – *Quercus petraea*, **Qr** – *Quercus robur*, **Pav** – *Prunus avium*, **Pn** – *Populus nigra*, **Sc** – *Salix caprea*, **Sn** – *Sambucus nigra*, **sax** – siliceous rock, **sr** – sandstone rock, **Tc** – *Tilia cordata*, **rw** – rotting wood, **tw** – timber wood.

*Agonimia tristicula* (Nyl.) Zahlbr. – 7 (OP1153, JPH, JV, DS1627)

*Amandinea punctata* (Hoffm.) Coppins & Scheid. – 4 Fe, 5 Pav, 10 Aps, Fe (DS & AF, OP)

*Anisomeridium polypori* (Ellis & Everh.) M. E. Barr – 8 Qr (DS & AF)

\**Arthonia galactinaria* Leight. – 5 (on *Lecanora dispersa*, JK)

\**Arthonia phaeophysciae* Grube & Matzer – 5 (on *Phaeophyscia orbicularis*, JK)

*Arthonia radiata* (Pers.) Ach. – VU, 2 Fe, Cb, 4 Fe, 6 (AM, JK, JM2029, JPH, JS)

*Arthonia spadicea* Leight. – NT, 1, 2 Ag, 4 Aps, Fe (DS & AF, FB665, JK, AM, JPH7631, JV7287)

\**Arthrorhaphis aeruginosa* R. Sant. & Tønsberg – 2 (on *Cladonia pyxidata*, JK)

*Aspicilia calcarea* (L.) Mudd – 2 csr, 6 cs, 7 (DS, JM2032)

*Aspicilia contorta* (Hoffm.) Kremp. – 7 cs, 9 sr (AM, DS, JPH, JS)

*Bacidia rubella* (Hoffm.) A. Massal. – VU, 8 Qr (DS & AF)

*Bacidina* cf. *adastra* (Sparrus & Aptroot) M. Hauck & V. Wirth – 7 Sc (JV7294)

*Bacidina caligans* (Nyl.) Llop & Hladun – 7 cr (JV7312)

*Bacidina chlorotricula* (Nyl.) Vězda & Poelt – 2, 7 (JV7281, 7303)

*Bacidina inundata* (Fr.) Vězda – VU, 2, 4 isb (DS & AF, JK, JM2023, JPH7642)

*Buellia griseovirens* (Turner & Borrer ex Sm.) Almb. – 1 Fe, 5 Pav, 7 Pav, Pn (AM, DS, JK, JM, JPH7638)

*Buellia schaeererii* De Not. – VU, 8 Fs (AM, DS, JM, JPH7638)

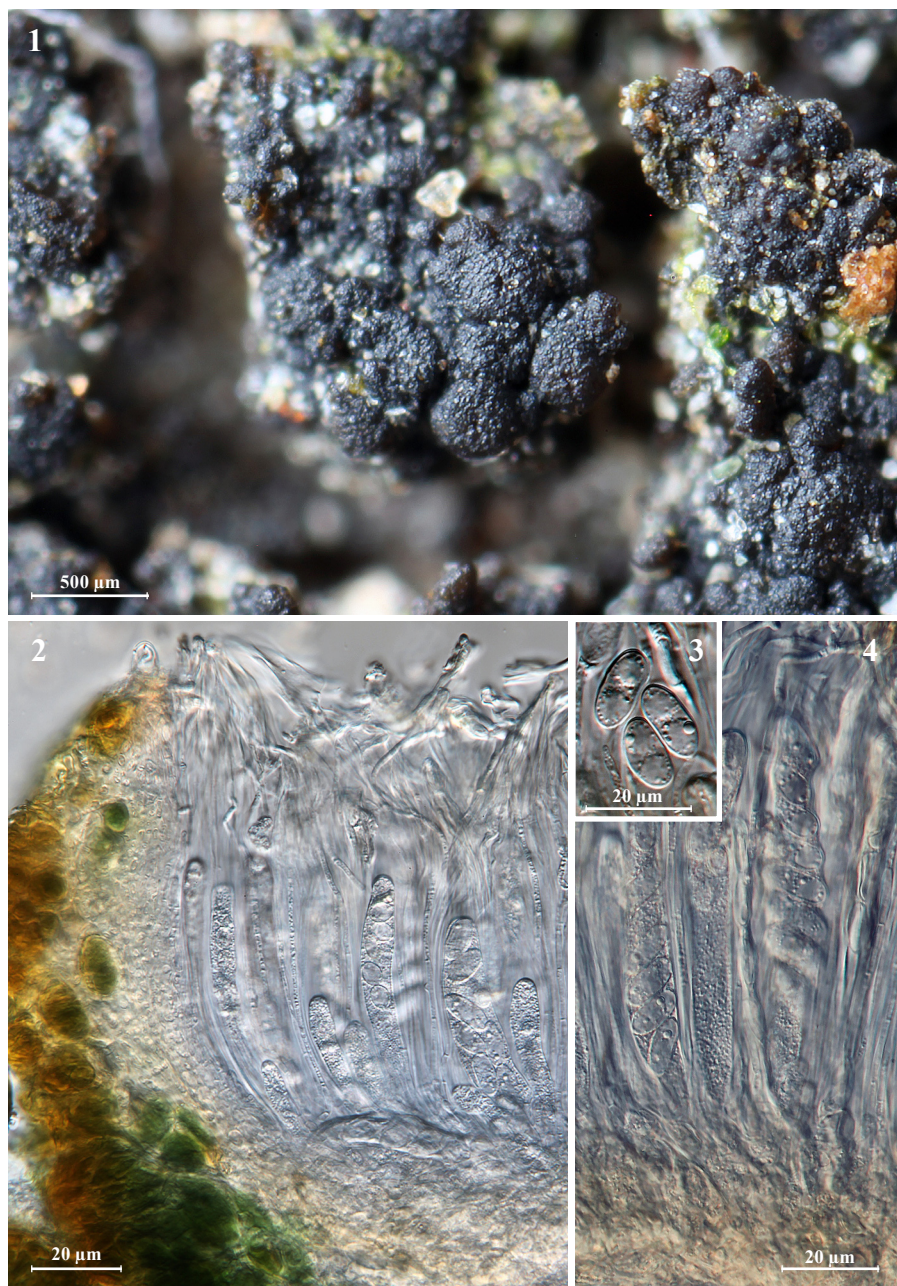
*Calicium pinastris* Tibell – VU, 2 Ps (JM)

*Caloplaca cerinelloides* (Erichsen) Poelt – 7 (FB 671, JV7294)

*Caloplaca chlorina* (Flot.) Sandst. – 5 cr, 7 (AM, JK, JPH)

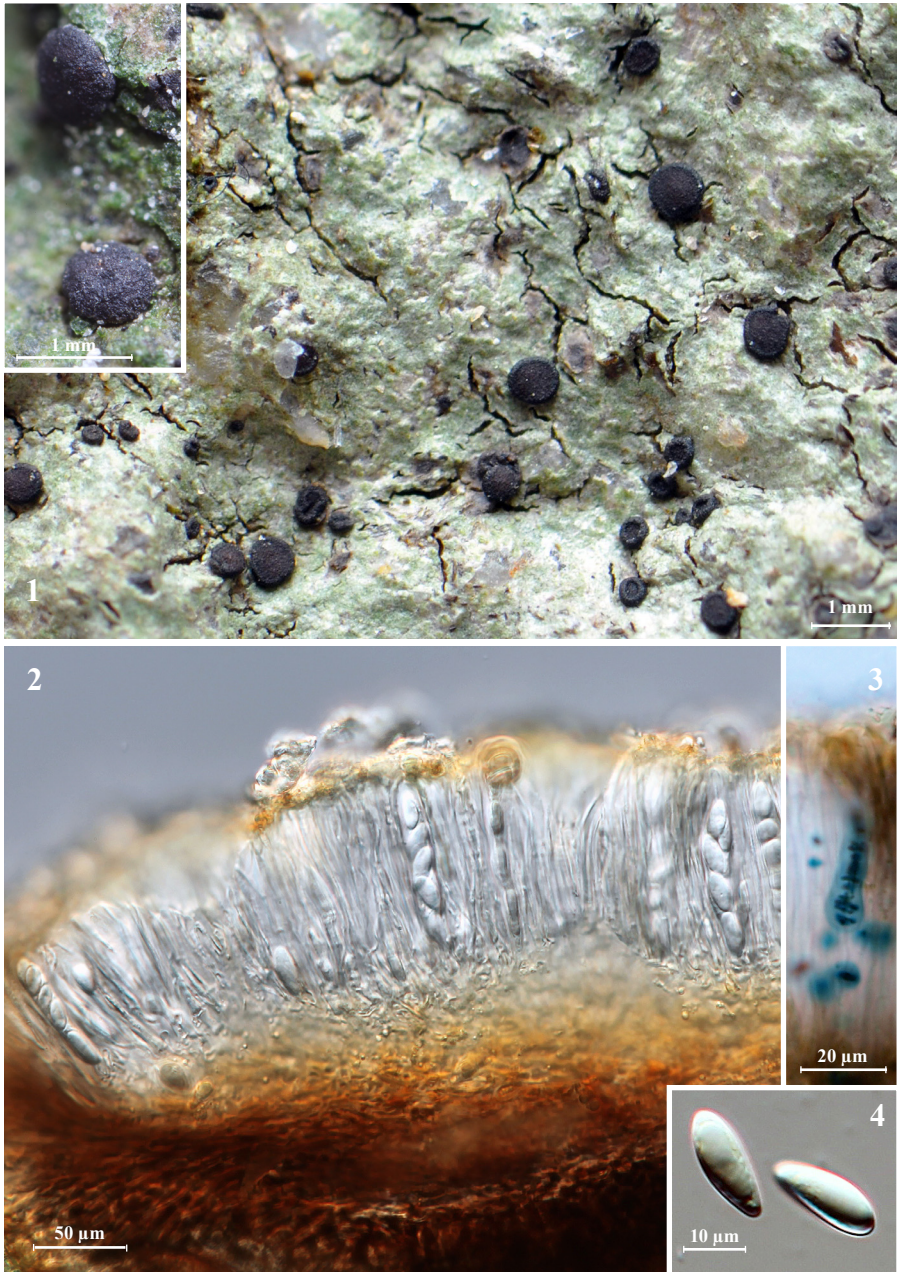
*Caloplaca* cf. *citrina* (Hoffm.) Th. Fr. – 2 c, 5 (DS & AF, JV7285)

- Caloplaca crenulatella* (Nyl.) H. Olivier – 2 c, 6, 7, 8 (AM, JM & AF, JPH, JS, JV7291)  
*Caloplaca decipiens* (Arnold) Blomb. & Forssell – 7 c (AM, JPH)  
*Caloplaca dolomiticola* s. l. – 7 c (JS)  
*Caloplaca oasis* (A. Massal.) Szat. – 6 c (AM, JPH)  
*Caloplaca pyracea* (Ach.) Th. Fr. – 7 (JV7294, 7308)  
*Caloplaca saxicola* s. l. – 7 c (JS)  
*Caloplaca soralifera* Vondrák & Hrouzek – 6 c, 7 (AM, JPH, JV7290)  
*Caloplaca variabilis* s. l. – 7 cr, 8 lr (AM, DS, JV7289, JPH7649)  
*Candelariella aurella* (Hoffm.) Zahlbr. – 7 cr (DS & AF, JV7306)  
*Candelariella reflexa* (Nyl.) Lettau – 10 Aps, Fe (DS, OP)  
*Candelariella subdeflexa* (Nyl.) Lettau – 8 Sn (JV7288)  
*Candelariella xanthostigma* (Ach.) Lettau – 3 Qp, 5, 7, 10 Aps, Fe (DS, DS & AF)  
*Catillaria nigroclavata* (Nyl.) Schuler – VU, 7 Fs, 8 (JS658, JV7296, 7307)  
*Chaenotheca brachypoda* (Ach.) Tibell – VU, 1 Aps, dw, Fs (AM, JM2015, JPH7636)  
*Chaenotheca chlorella* (Ach.) Müll. Arg. – EN, 1 dw, Fs, 2 Tc (JM2014, DS & AF)  
*Chaenotheca chrysocephala* (Turner ex Ach.) Th. Fr. – NT, 2 Tc (AM, JPH)  
*Chaenotheca ferruginea* (Turner & Borrer) Mig. – 4 Ag (JK)  
*Chrysothrix chlorina* (Ach.) J. R. Laundon – 2 gr (JK)  
*Cladonia caespiticia* (Pers.) Flörke – NT, 2 sl (OP1147)  
*Cladonia chlorophaea* s. l. – 2 dw, 7 as (DS & AF)  
*Cladonia chlorophaea* s. str. – 2 mb (OP1148)  
*Cladonia coniocraea* (Flörke) Spreng. – 4 dw (DS & AF)  
*Cladonia fimbriata* (L.) Fr. – 4 dw (DS & AF)  
*Cladonia macilenta* Hoffm. – 2 dw (OP)  
*Cladonia monomorpha* Aptroot, Sipman & Herk – 2 mb (OP1150)  
*Cladonia ochrochlora* Flörke – 4 dw (DS & AF)  
*Cladonia pleurota* (Flörke) Schaer. – NT, 2 as (OP1149)  
*Cladonia pocillum* (Ach.) Grognot – 7 cs (OP1155)  
*Cladonia pyxidata* (L.) Hoffm. – 4 ms-gr (JK)  
*Cladonia rangiferina* (L.) H. Wigg. – NT, 4 ms-gr (JK)  
*Cladonia subulata* (L.) Weber ex F. H. Wigg. – 7 dw (DS & AF)  
*Coenogonium pineti* (Schrad. ex Ach.) Lücking & Lumbsch – 1 dw, 2, 4 Aps (DS & AF, JV7286, JPH7636)  
*Collema auriforme* (With.) Coppins & J. R. Laundon – NT, 7 lr (DS1626, JV7310, JPH7650)  
*Collema crispum* (Huds.) Weber ex F. H. Wigg. – NT, 7 (DS)  
*Collema cristatum* (L.) Weber ex F. H. Wigg. – NT, 7 (DS)  
*Collema fuscovirens* (With.) J. R. Laundon – 7 (DS)  
*Collema limosum* (Ach.) Ach. – NT, 7 cs (JPH7647)  
*Collema tenax* (Sw.) Ach. – 7 cs, 8 (DS1625, FB670)  
*Dermatocarpon luridum* (With.) J. R. Laundon – VU, 2, 4 isb (AM, DS & AF, JK, JPH)  
*Diploschistes muscorum* (Scop.) R. Sant. – 2 (JK on *Cladonia pyxidata*, OP1150 on *C. monomorpha*)  
*Diplotomma alboatrum* (Hoffm.) Flot. – NT, 5 c (DS & AF)  
*Enterographa hutchinsiae* (Leight.) A. Massal. – NT, 2 sr (AM, JPH)  
*Evernia divaricata* (L.) Ach. – CR, 10 Fe (OP)  
*Graphis scripta* (L.) Ach. – VU, 2 Fe, 4 Cb (AM, DS & AF, JK, JPH)  
*Hypocomyce scalaris* (Ach.) M. Choisy – 5 Pav, 10 Aps (DS, OP)  
*Hypogymnia physodes* (L.) Nyl. – 2 Ag, 5 Pav, 10 Aps, Fe (DS & AF, JK, OP)  
*Hypogymnia tubulosa* (Schaer.) Hav. – NT, 5, 10 Aps, Fe (DS & AF, OP)  
*Imshaugia aleurites* (Ach.) S. L. F. Mey. – VU, 2 Ps, 3 (JM2037)  
*Lecania cyrtella* (Ach.) Th. Fr. – 1a, 7 Pn (JPH7639, JV7309)  
*Lecanora albescens* (Hoffm.) Flörke – 5 (JK)  
*Lecanora campestris* (Schaer.) Hue – NT, 2 csr, 6 (JM2033)  
*Lecanora cenisia* Ach. – NT, 2 (JV7284)  
*Lecanora chlarotera* Nyl. – 10 Aps, Fe (DS, OP)  
*Lecanora conizaeoides* Nyl. ex Cromb. – 10 Aps (DS)  
*Lecanora expallens* Ach. – 2 Fe, 4 Fe, 6, 10 Aps, Fe (DS & AF, JM2028)  
*Lecanora orosthea* (Ach.) Ach. – NT, 2 sr (AM, JPH)  
*Lecanora persimilis* (Th. Fr.) Nyl. – NT, 1a Pn (AM, JPH7637)

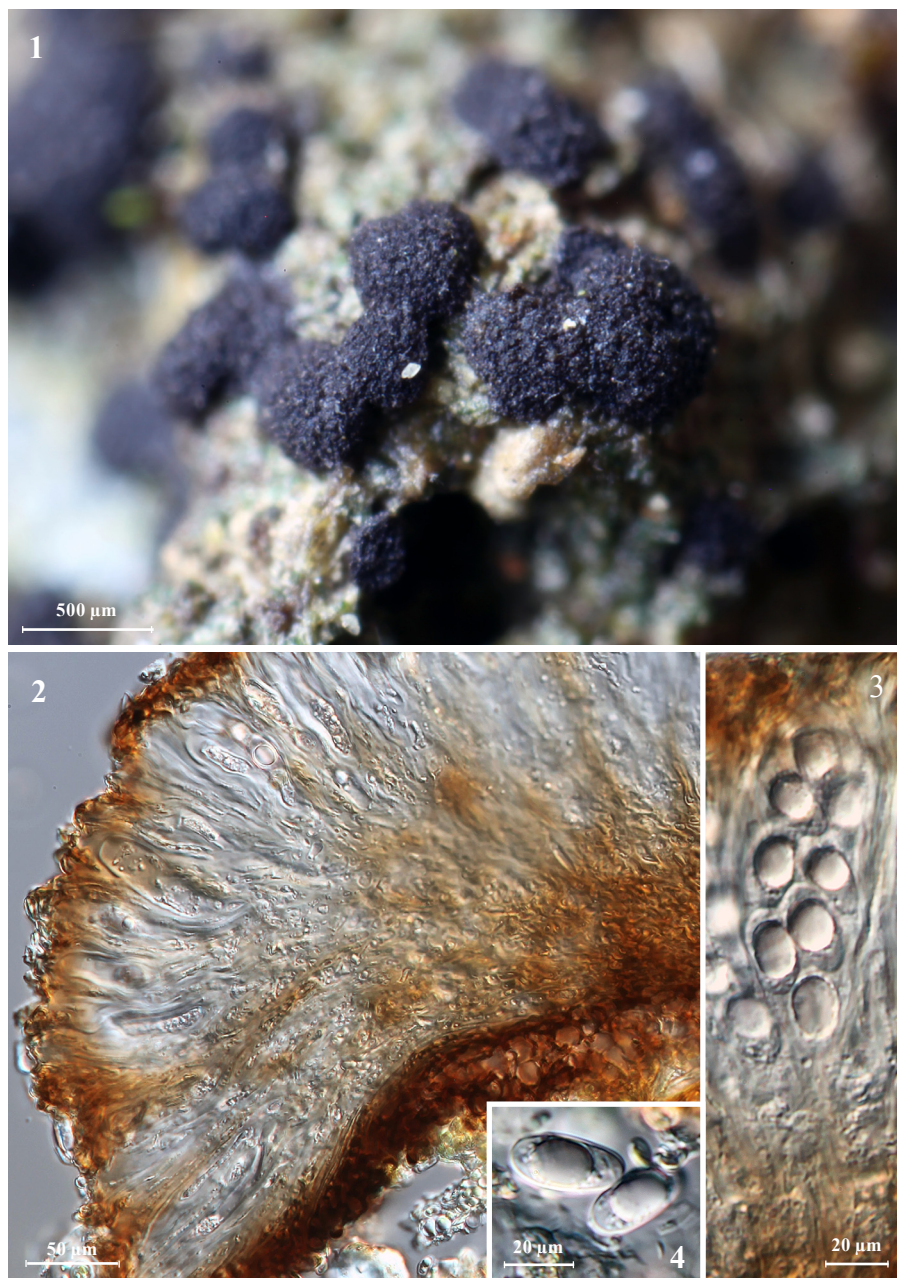


**Tab. 1:** *Porocyphus coccodes* (Flotow) Körber: **1** – stélka s plodnicemi (thallus with ascomata), **2** – svislý řez plodnicí (vertical section of an ascoma), **3** – askospory (ascospores), **4** – vřečka (asci), foto J. P. Halda.





**Tab. II:** *Lecidea ahlesii* (Hepp) Nyl.: 1 – stélka s plodnicemi (thallus with ascomata), 2 – svislý řez plodnici (vertical section of an ascoma), 3 – krystaly v hymeniu (crystals in hymenium), 4 – askospory (ascospores), foto J. Malíček & J. P. Halda.



**Tab. III:** *Steinia geophana* (Nyl.) Stein: 1 – stélka s plodnicemi (thallus with ascomata), 2 – svislý řez plodnicí (vertical section of an ascoma), 3 – zralé věčko (mature ascus), 4 – askospory (ascospores), foto J. P. Halda.





**Tab. IV:** *Rhizocarpon badioatrum* (Flörke ex Sprengel) Th. Fr., **1** – stélka s plodnicí (thallus with an ascoma), **2** – svislý řez plodnicí (vertical section of an ascoma), **3** – mladé vřečko (young ascus), **4** – zralá askospora (mature ascospore), foto J. P. Halda.

- Lecanora pulicaris* (Pers.) Ach. – 1 Fe, 1a Pn, 2 Fe, 4, 6 ( JM2017, 2022, 2027)  
*Lecanora saxicola* (Pollich) Ach. – 2 c, 5 gr (FB, DS & AF, JK)  
*Lecanora saligna* (Schrad.) Zahlbr. – 7 dw (DS1623)  
*Lecidea ahlesii* (Hepp) Nyl. – 1 isb (JM2019, JPH7633, PRC)  
*Lecidea fuscoatra* (L.) Ach. – 1 gr (JK)  
*Lecidella elaeochroma* (Ach.) M. Choisy – NT, 4 Cb, Fe (DS & AF, JK)  
*Lecidella carpathica* Körb. – 2 gr (JK)  
*Lecidella stigmatea* (Ach.) Hertel & Leuckert – 2 csr, 7 cr (JM & AF, JV7301)  
*Lepraria lobificans* auct. – 1, 7 Aps (AM, JPH7354, OP1158–1160)  
*Lepraria membranacea* (Dicks.) Vain. – 2 (JM & AF)  
*Leptogium gelatinosum* (With.) J. R. Laundon – VU, 7 (DS1624, JV7292)  
*Leptogium plicatile* (Ach.) Leight. – VU, 7 cr (DS & AF)  
*Leptogium pulvinatum* Otálora. –7 (AM, AF)  
 \* *Lichenochora coarctatae* (de Lesd.) Hafellner & F. Berger – 2 (JV7279)  
*Lichenomphalia umbellifera* (L.:Fr.) Redhead et al. – 2 (AM, JPH)  
*Melanelixia fuliginosa* (Fr. ex Duby) O. Blanco et al. – 2 gr, 4 Aps, 10 Aps, Fe (JK, DS & AF, OP)  
*Melanohalea exasperatula* (Nyl.) O. Blanco et al. – 5 Pav, 10 Aps, Fe (JK, DS, OP)  
*Micarea botryoides* (Nyl.) Coppins – 2 gr (JK)  
*Micarea lutulata* (Nyl.) Coppins – VU, 7 (JV7311)  
*Opegrapha varia* Pers. – NT, 1 (JM2013, 2016)  
*Opegrapha vermicellifera* (Kunze) J. R. Laundon – VU, 1 Aps (AM, JM2012, JPH7635)  
*Opegrapha vulgata* s. 1. – 2 Fe (AM, JPH, JS)  
*Parmelia ernstiae* Feuerer & A. Thell – 10 Aps (OP, DS)  
*Parmelia saxatilis* (L.) Ach. – 10 Aps, Fe (DS, OP)  
*Parmelia submontana* Nádv. ex Hale – EN, 1 Pn (Kocourková-Horáková 1998), 10 Aps, Fe (OP, DS)  
*Parmelia sulcata* Taylor – 5 Pav (JK), 10 Aps, Fe (OP, DS)  
*Peltigera polydactylon* (Neck.) Hoffm. – EN, 2 mb (AM, JPH, DS1622)  
*Peltigera praetextata* (Flörke ex Sommerf.) Zopf – NT, 2 csr (DS1621), 6 mb (AM, JM2035, JPH)  
*Peltigera rufescens* (Weiss) Humb. – NT, 7 as (AM, DS & AF)  
*Pertusaria amara* (Ach.) Nyl. – NT, 3 Qp (JM & AF), 10 Aps, Fe (DS, OP)  
*Pertusaria corallina* (L.) Arnold – 2 gr (JK)  
*Pertusaria lactea* (L.) Arnold – 2 gr (JK)  
*Phaeophyscia nigricans* (Harm.) Moberg – 5 c, Ca, Pav (DS & AF)  
*Phaeophyscia orbicularis* (Neck.) Moberg – 1a Pn, 5 (DS & AF, JM)  
*Phaeophyscia sciastra* (Ach.) Moberg – NT, 5 c (DS & AF)  
*Phlyctis argena* (Spreng.) Flot. – 4 Fe, Qp, 7 (AM, DS & AF), 10 Aps, Fe (DS, OP)  
*Physcia adscendens* (Fr.) Oliv. – 1a Aps, Pn, 5 Fe, 7 Qp, 10 Aps, Fe (DS & AF, JM, DS, OP)  
*Physcia caesia* (Hoffm.) Fürnr. – 5 c (DS & AF)  
*Physcia dubia* (Hoffm.) Lettau – 1a Pn (AM, JM, JPH)  
*Physcia tenella* (Scop.) DC. – 1a Fe, 5 Pav, 7 Pn, 10 Aps, Fe (DS & AF, JM2020, JPH7639, DS, OP)  
*Piccolia ochrophora* (Nyl.) Hafellner – NT, 7 Sn (DS & AF)  
*Placopyrenium fuscellum* (Turner) Gueidan & Cl. Roux – VU, 7 cr (DS & AF)  
*Placynthiella icmalea* (Ach.) Coppins & P. James – 3 dw (JM & AF)  
*Placynthium nigrum* (Huds.) Gray – NT, 2 csr, 6 cr (JM2031, JM & AF)  
*Platismatia glauca* (L.) W. L. Culb & C. F. Culb. – 10 Aps, Fe (DS, OP)  
*Pleurosticta acetabulum* (Neck.) Elix & Lumbsch – VU, 10 Aps, Fe (OP, DS)  
 \* *Polysporina subfuscescens* (Nyl.) K. Knudsen & Kocourk. – 5 (DS & AF)  
*Porina aenea* (Wallr.) Zahlbr. – 1, 4 Fs (DS1618), 8 Aps (JPH7635, DS & AF)  
*Porina chlorotica* (Ach.) Müll. Arg. – 1 (JPH7630)  
*Porina lectissima* (Fr.) Zahlbr. – VU, 2 gr (AM, OP1152, FB672, JPH7568, JV7298, DS1619)  
*Porina leptalea* (Durieu & Mont.) A. L. Sm. – EN, 1 Fs, 2 Fs, 4 Fs (AM, JPH, DS1618)  
*Porocypus coccodes* (Flot.) Körb. – 2 gr (JV7283, JPH7643)  
*Porpidia soledizodes* (Lamy ex Nyl.) J. R. Laundon – 2 gr (JK)  
*Protoblastenia rupestris* (Scop.) J. Steiner – 7 c (DS & AF)  
*Pseudevernia furfuracea* (L.) Zopf – 5 Pav, 10 Aps, Fe (JK, DS, OP)  
*Psilolechia lucida* (Ach.) M. Choisy – 2,4 gr (JK)  
*Ramalina farinacea* (L.) Ach. – VU, 10 Aps, Fe (DS, OP)  
*Ramalina fastigiata* (Pers.) Ach. – EN, 10 Aps, Fe (DS, OP)



- Ramalina fraxinea* (L.) Ach. – EN, 10 Aps, Fe (DS, OP)  
*Ramalina pollinaria* (Westr.) Ach. – NT, 10 Aps, Fe (OP, DS)  
*Rhizocarpon badioatrum* (Flörke ex Sprengel) Th. Fr. – NT, 2 gr (JPH7643)  
*Rinodina bischoffii* (Hepp) A. Massal. – 7 cr (AM, DS & AF)  
*Rinodina pyrina* (Ach.) Arnold – VU, 7 Cl (OP1154), 8 on *Prunus* (FB666)  
 \**Roseliniella microthelia* (Wallr.) Nik. Hoffm. & Hafellner – 2 (on *Trapelia placodioides*, JK)  
*Sarcogyne regularis* Körb. – 7 c (DS & AF)  
*Sarcosagium campestre* (Fr.) Poetsch & Schied. – 7 cs (AM, DS & AF, JV7304)  
*Scoliciosporum umbrinum* (Ach.) Arnold – 8 Fs (JS657)  
 \**Sclerococcum sphaerale* (Ach.) Fr. – 2 (on *Pertusaria corallina*, JK)  
*Staurothele fissa* (Taylor) Zwackh – EN, 2 gr (JPH7644)  
*Steinia geophana* (Nyl.) Stein – 2 rw, 7, 8 cs (AM, FB667, JPH7648, OP1151)  
*Strangospora pinicola* (A. Massal.) Körb. – NT, 10 Aps (OP1157)  
*Thelidium* aff. *zwackhii* (Hepp) A. Massal. – NT, 7 (JV7305)  
*Thelocarpon intermediellum* Nyl. – NT, 8 rw (OP1156)  
*Thelocarpon laureri* (Flot.) Nyl. – 2 tw (FB, JK)  
*Trapelia coarctata* (Sm.) M. Choisy – 7 sax (DS & AF)  
*Trapelia obtegens* (Th. Fr.) Hertel – 7 sax (DS & AF)  
*Trapelia placodioides* Coppins & P. James – 2, 4 gr (JK, JV7280)  
*Trapeliopsis flexuosa* (Fr.) Coppins & P. James – 3 dw (JM & AF)  
*Trapeliopsis granulosa* (Hoffm.) Lumbsch – 3 csr, 6 (JM2024)  
*Trapeliopsis pseudogranulosa* Coppins & P. James – 6 (JM2030)  
*Tuckermannopsis chlorophylla* (Willd.) Hale – NT, 10 Aps, Fe (DS, OP)  
*Usnea* sp. – 10 Aps, Fe (DS, OP)  
*Verrucaria aethiobola* Wahlenb. – VU, 1 isb, 2 gr (JPH7630, 7640, 7641, 7642)  
*Verrucaria funckii* (Spreng.) Zahlbr. – VU, 4 isb (JS661)  
*Verrucaria hydrela* Ach. – VU, 2 isb (JM2024)  
*Verrucaria muralis* Ach. – 2 c, 5 cr, 7 lr (DS & AF, JK, JPH7646)  
*Verrucaria nigrescens* Pers. – 2 c, 7 (JM & AF, JK, JV7299)  
*Verrucaria praetermissa* (Trevisan) Anzi – VU, 2 gr (AM, JM2025, JPH7645, DS1620)  
*Vezdaea aestivalis* (Ohlert) Tscherm.-Woess & Poelt – NT 8 (FB669)  
*Xanthoparmelia conspersa* (Ach.) Hale – 2 gr (JK)  
*Xanthoparmelia pulla* (Ach.) O. Blanco & al. – 2 gr (JK)  
*Xanthoria candelaria* (L.) Th. Fr. – 1a Pn, 10 Aps, Fe (DS, OP, JM, JPH 7639)  
*Xanthoria elegans* (Link) Th. Fr. – 5 cr, 7 (DS & AF, JK)  
*Xanthoria parietina* (L.) Th. Fr. – 1a Pn, 7 Cl, 10 Aps, Fe (JPH7639, DS, OP)

### Comments on noteworthy species

#### *Bacidina caligans* (Nyl.) Llop & Hladun

Sterile sorediate crusts of this species are obviously common in urban and rural landscapes. Preferred substrata are concrete, soil or pebbles and typical habitats are e.g. train stations and old quarries, but it can be also found on dusty subneutral bark of trees in parks of suburban agglomerations. It forms patches of inconspicuous thalli with greenish-yellow, punctiform soralia. When sterile, it is hardly recognizable from *Bacidina adastrata* (Sparrius & Aptroot) M. Hauck & V. Wirth, which reputedly prefers to grow on tree barks (Coppins & Aptroot 2009). Until we recorded a fertile population for the first time (CBFS JV7778), epigaeic and saxicolous samples had been identified as *B. adastrata* (e.g. Vondrák 2006). The fertile specimen fully corresponded with the description of *B. caligans* provided by Coppins & Aptroot (2009); thallus with discrete dull-green soralia, apothecia with K<sup>+</sup> purple pigment, „*Bacidina*“ type of true exciple with cellular lumina, and short filiform conidia (30–35 µm long). Based on the similarity in soralia and ecology, and following the epigaeic and saxicolous samples the sterile specimens presented here are considered now as *B. caligans*. Further investigations are needed to decide if the sterile epiphytic specimens from the Czech Republic belong to *B. adastrata* or *B. caligans*.

- Other records from the Czech Republic: Central Bohemia. Kladno, Švermov, Čabárna, former colliery Zápotocký – the hopper tip, alt. 310 m, WGS-84: N50°10'44.494" E14°8'34.568", on slag, 2010, O. Peksa, J. Vondrák (CBFS JV7778); Praha, Uhříněves, Uhříněveská obora game reserve, at small bridge

over the Uhříněveský potok brook, alt. 280 m, WGS-84: N50°02'13.297" E14°36'11.249", on bark of *Acer platanoides*, 2010, coll. J. Kocourková, K. Knudsen (JK 7741); Rakovník, Městečko u Křivoklátu, at railway station, on iron-incrusted pebbles and soil in railway line, 2006, J. Vondrák (CBFS JV4296); Rakovník, Pustověty, in railway station, WGS-84: N50°03'20" E13°49'00", 2006, J. Vondrák (CBFS JV1936). South Bohemia. České Budějovice, Mydlovary, settling pit „MAPE“, alt. 400 m, WGS-84: N49°05'58.153" E14°20'07.759", on decaying leaves over clay soil, 2007, J. Vondrák (CBFS JV5854); Český Krumlov, Nové Dobrkovice, protected area „Vyšenské kopce“, alt. 520–540 m, WGS-84: N48°49'10" E14°17'50", 2006, J. Vondrák (CBFS JV2357); Husinec, Těšovice, railway station, alt. 480 m, WGS-84: N49°02'40" E14°01'40", on pebbles in rail-line, 2006, J. Vondrák (CBFS JV2435). North Moravia, Javorník ve Slezsku, railway station, alt. ca 300 m, WGS-84: N50°23'30" E17°01'00", on pebbles and pieces of slag in railway-line, 2004, J. Vondrák (CBFS JV1726).

***Candelariella subdeflexa* (Nyl.) Lettau**

An abundant population of the species occurred near Vápenný Podol but without apothecia. Its sterile populations may be easily confused with small *Phaeophyscia* species or *Agonimia tristicula*. However, it forms characteristic grey-green squamules which erode into granules on their margins. Free conidiophores arranged in groups on the lower surfaces of squamules provide another important character (Westberg 2007). The species has been recently newly recorded from the Czech Republic (Malíček et al. 2008); in contrast to our record, that population was richly fertile.

***Evernia divaricata* (L.) Ach.**

*Evernia divaricata* is a widespread circumboreal species, occurring in central Asia and Siberia (Ahlner 1948), in the Rocky Mountains and Alaska in North America (Ahlner 1948, Bird 1974, Thomson 1984), and in Europe (Ahlner 1948, Poelt 1969). In the central Europe this epiphytic lichen is described as rare and in decline. It typically grows in humid habitats with high precipitation (Lange et al. 2005). Goward & Ahti (1992) mention good light conditions as important for this species. It is very sensitive to atmospheric pollution (Liška et al. 1996). *Evernia divaricata* rarely develops soredia or apothecia (Ahlner 1931, 1948), and the species is apparently anemochorously dispersed by thallus fragments (Tønsberg et al. 1996).

In the Czech Republic the species grew in mountainous regions on acid bark of spruce in the past but started to disappear with increasing atmospheric pollution. In the 90's it was known only from twelve localities in the Šumava mountains where it grew on deciduous trees as well (Liška et al. 1996). Nowadays the species spreads together with other epiphytic lichens that were considered rare in the Czech Republic (for example *Evernia mesomorpha*, *Usnea* spp., *Cetrelia olivetorum* s. l., *Flavopunctelia flaventior*, *Hypogymnia bitteri*) into untypical habitats – shrubby areas dominated by *Prunus spinosa* and *Crataegus* sp. or on branches of *Larix decidua*.

***Lecidea ahlesii* (Hepp) Nyl.**

*L. ahlesii* is characterized by the presence of blue-violet (K+ green) granules in hymenium and hypothecium (Smith et al. 2009). The granules are present in well-developed apothecia, often only in some sections. A preliminary phylogenetic analysis places *L. ahlesii* close to the genus *Clauzadea* (Arup 2004). The taxon occurs in areas with suboceanic climatic conditions (Jørgensen 1996). It seems to be a rather rare lichen in Europe (Arup 2004). *Lecidea ahlesii* grows on periodically inundated, shaded siliceous rocks and boulders. In the Polom Nature Reserve it was found in a small periodical brook in a shady forest.

- Other specimens from the Czech Republic: S Bohemia, distr. Písek, Oslov, NW of the trail cross-roads 'Lísek', S of nature reserve Krkavčina, a ravine deciduous forest (*Acer pseudoplatanus*, *Fagus sylvatica*) and a spring-area with fir-trees (*Abies alba*) above a creek flowing W-wards into Vltava river, WGS-84: N49°23'53.5–54" E14°11'06–07.5", on wet granite stones, assoc. *Porina chlorotica*, alt. 382–385 m, 15. 5. 2010, Z. Palice 13608, 13647 (PRA).

***Porocyphus coccodes* (Flot.) Korb.**

A minute freshwater lichen with dark green (photobiont cyanobacterial) crustose areolate thallus. Small apothecia (pycnoascocarps) are sessile on areoles and contain octosporic asci with simple ascospores. It grows on exposed, acidic rock faces moistened by water and semi-aquatic along streams, rocky lake shores and waterfalls. It is also known from fresh water tidal zones along the

Elbe River, occasionally on old walls etc. It is widespread in the Northern Hemisphere and known from lowlands to alpine regions (Thüs & Schultz 2008). This overlooked lichen was found several times in the Czech Republic: in Doubravka River near Chotěboř by Bayer (1922), in Krkonoše Mts by Migula (1929) and Kuřák (1952), in South Moravia by Suza (1921, 1930–1931) and recently in the foothills of Šumava Mts (Vondrák et al. 2010). Our sample grew on a wet siliceous boulder on the right bank of the Chrudimka river (the Krkanka Nature Reserve) with *Rhizocarpon badioatrum* and *Verrucaria aethiobola* (this record was previously published by Vondrák et al. 2010).

## Souhrn

Výzkum lišejníků Železných hor byl v minulých šedesáti letech zcela opomíjen, ačkoliv některé lokality v této oblasti byly díky nálezům Václava Kuřáka (Vápenný Podol) a Emanuela Kalenského (Škrovád, Chrudim) již po dlouhou dobu velmi ceněny. Během několika krátkých exkurzí bylo nalezeno 164 druhů lišejníků a sedm druhů lichenikolních hub (z toho podle kategorií červeného seznamu Liška & Palice (2010) sedm v kategorii EN, jeden CR, 22 VU, 27 NT). Mezi nejcennější patří mikrolišejníky z rezervace Krkanka (*Porina lectissima*, *Porocypus coccodes*, *Rhizocarpon badioatrum*, *Staurothele fissa* a *Verrucaria aethiobola*). Epifytická flóra zde není příliš bohatá, přesto zde byla na bázi buku nalezena bohatá populace druhu *Porina leptalea* a na borovicích *Calicium pinastri*. Výjimkou je chráněná alej jasanů a klenů ve Starém Ransku, kde se vyskytují např. *Parmelia submontana*, *Ramalina fastigiata*, *R. fraxinea* a zaznamenali jsme zde i mladou stélku *Evernia divaricata*. Velmi cennou lokalitou je rezervace Polom nedaleko Horního Bradla, kde byl nalezen pro naše území zatím neznámý druh *Lecidea ahlesii*. V lomu nedaleko Vápenného Podola jsme sbírali druh *Bacidina caligans*, který je pro naše území také nový, a v ČR málo známý epifytický druh *Candelariella subdeflexa*. Na betonové hrázi Křižanovské přehrady rostou hojně dosud přehlížené druhy *Caloplaca crenulatella* a *C. oasis*.

## References

- Ahlner S. (1931): *Evernia divaricata* (L.) Ach. funnen med soeredier. – Botaniska Notiser 1931: 219–221.
- Ahlner S. (1948): Utbredningstyper bland nordiska Barrträds-lavar. (Verbreitungstypen unter fennoskandische Nadelbaumflechten). – Acta Phytogeographica Suecica 22: 1–257.
- Arup U. (2004): Three overlooked *Lecidea* species in Sweden. – Symbolae Botanicae Upsalienses 34: 39–48.
- Bayer E. (1922): O některých zajímavých nálezích lišejníků v Čechách. – Věda Přírodní 3: 51–54.
- Bird C. D. (1974): Studies on the lichen genus *Evernia* in North America. – Canadian Journal of Botany 52: 2427–2434.
- Coppins B. J. & Aptroot A. (2009): *Bacidia* De Not. (1846). – In: Smith C. W. et al. (eds), The Lichens of Great Britain and Ireland, p. 136–138, The British Lichen Society, London.
- Goward T. & Ahti T. (1992): Macrolichens and their zonal distribution in Wells Gray Provincial Park and its vicinity, British Columbia, Canada. – Acta Botanica Fennica 147: 1–60.
- Jørgensen P. M. (1996): The oceanic element in the Scandinavian lichen flora revisited. – Symbolae Botanicae Upsalienses 31: 297–317.
- Kalenský E. (1906): Lišejníky. – In: Vepřek P. (red.), Chrudimsko a Nasavrcko. I. díl, p. 207–223, Chrudim.
- Kocourková-Horáková J. (1998): Records of new, rare or overlooked lichens from the Czech Republic. – Czech Mycology 50: 223–239.
- Kocourková J. (1999): Lichenicolous fungi of the Czech Republic. – Acta Musei Nationalis Pragae, Ser. B., Hist. Natur., 55: 59–169.
- Kuřák V. (1914): Výsledky výzkumu lišejníkové květeny východních a severovýchodních Čech v letech 1908–1913. – In: Panýrek D. (red.), Věstník V. sjezdu českých přírodopýtcův a lékařů v Praze, p. 334–335, Praha.
- Kuřák V. (1923): Vzácné lišejníky české. – In: Anonymus (red.), Věstník I. sjezdu československých botaniků v Praze, p. 60, Praha.
- Kuřák V. (1927a): První příspěvek ku květeně českých lišejníkův. – Věstník Klubu přírodovědeckého Prostějov 12: 179–202.
- Kuřák V. (1927b): Druhý příspěvek ku květeně českých lišejníkův. – Věstník Klubu přírodovědeckého Prostějov 14: 55–74.



- Kučák V. (1927c): Třetí příspěvek ku květeně českých lišejníků. – *Preslia* 5: 36–51.
- Kučák V. (1952): Lišejníky v Krkonoších. – *Časopis Národního Musea* 121: 106–116.
- Lange O. L., Türk R. & Zimmermann D. G. (2005): Neufunde der boreal-montanen Flechte *Evernia divaricata* im trocken-warmen Main-Tauber-Gebiet und ihre Begleiter. – *Herzogia* 18: 51–62.
- Liška J., Dětinský R. & Palice Z. (1996): Importance of the Šumava Mts. for the biodiversity of lichens in the Czech Republic. [Význam Šumavy pro biodiverzitu lišejníků v České republice]. – *Silva Gabreta* 1: 71–81.
- Liška J. & Palice Z. (2010): Červený seznam lišejníků České republiky (verze 1.1). – *Příroda* 29: 3–66.
- Malíček J., Palice Z., Bouda F., Czarnota P., Halda J. P., Liška J., Müller A., Peksa O., Svoboda D., Syrovátková L., Vondrák J. & Wagner B. (2008): Lišejníky zaznamenané během 15. jarního setkání Bryologicko-lichenologické sekce ČBS na Sedlčansku. – *Bryonora* 42: 17–30.
- Migula W. (1929): Flora von Deutschland, Österreich und der Schweiz in Wort und Bild. Band IV: Flechten, 1. Teil. – In: *Kryptogamen-Flora. Moose, Algen, Flechten und Pilze. Band XI, Abteilung 1.*, Berlin – Lichterfelde. 4/1. [527 pp.]
- Servít M. (1954): Československé lišejníky čeledi Verrucariaceae. – ČSAV, Praha. [249 pp.]
- Poelt J. (1969): Bestimmungsschlüssel europäischer Flechten. – J. Cramer, Lehre. [757 pp.]
- Suza J. (1921): Čtvrtý příspěvek k lichenologii Moravy. – *Sborník Klubu Přírodovědeckého Brno* 3: 1–50.
- Suza J. (1930–1931): Srovnávací studie o lišejníkové floře serpentínů (Mohelno, Gurhof a Kraubath). – *Sborník Přírodovědeckého spolku Moravská Ostrava* 6: 231–256.
- Thomson J. W. (1984): American Arctic lichens 1. The macrolichens. – Columbia University Press, New York. [504 pp.]
- Thüs H. & Schultz M. (2008): Süßwasserflora von Mitteleuropa, Bd. 21/1: Fungi, 1. Teil: Flechten. – Spektrum, Heidelberg. [223 pp.]
- Tønnsberg T., Gauslaa Y., Haugan R., Holien H. & Timdal E. (1996): The threatened macrolichens of Norway. – *Sommerfeltia* 23: 1–283.
- Vondrák J. (2006): Lišejníky chráněného území Vyšenské kopce u Českého Krumlova. – *Bryonora* 37: 9–18.
- Vondrák J., Merkulova O. & Redchenko O. (2010): Několik pozoruhodných nálezů z Šumavského předhůří (Several noteworthy lichens found in the foothills of the Šumava Mts, South Bohemia, Czech Republic). – *Bryonora* 45: 31–35.
- Westberg M. (2007): *Candelariella* (Candelariaceae) in western United States and northern Mexico; the species with biatorine apothecia. – *Bryologist* 110: 365–374.