

New and noteworthy lichens in the Czech Republic – genus *Rinodina*

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Abstract – New information on distribution of seven species of the genus *Rinodina* in the Czech Republic is provided. *R. castanomesodes* and *R. zwackhiana* are new for the country. *R. aspersa*, *R. calcarea*, *R. pityrea* and *R. septentrionalis* have been published before, but knowledge on their distribution within the country is very poor. *R. occulta* is rediscovered after approximately 150 years. The data on ecology and chorology are given for each species.

Key words – biodiversity, distribution, ecology, lichen-forming fungi

Introduction

This article is further contribution to the lichen flora of the Czech Republic. Recent floristic investigations have yielded many new national records as well as rediscoveries of species not recorded for many years (e.g. Kocourková-Horáková 1998, Palice 1999). This is demonstrated here by selected species of the genus *Rinodina*. Some of the representatives are rather inconspicuous or often sterile. Knowledge on distribution of most of these taxa is very incomplete.

The lack of information on some species is partly explained by the fact that some of the included taxa are recently described and poorly known (*R. castanomesodes* and *R. pityrea*). The nitrophilous species *R. pityrea* mainly grows on man-made substrates, which are rarely studied by lichenologists. Moreover, some species are genuinely rare (*R. castanomesodes*, *R. occulta*, and *R. zwackhiana*).

Materials and methods

The presented findings have mostly been collected by the authors and vouchers are currently deposited in the herbarium of the Faculty of Biological Sciences, the Uni-

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versity of South Bohemia, České Budějovice (CBFS), the herbarium of the Department of Mycology, National Museum, Prague (PRM) and in the private herbarium of Z. Palice (hb. Palice).

All the discussed species are followed by a list of recorded localities and short information on important characters, ecology and distribution. Some localities include the number of the MTB square (grid system used in Central European mapping scheme). Species new to the Czech Republic are indicated by an asterisk. The nomenclature corresponds to Nimis & Martellos (2003), the nomenclature of insoluble lichen pigments follows Meyer & Printzen (2000).

Results

Rinodina aspersa

A usually sterile, sorediate species with more or less circular thallus, often delimited by a black prothallus. Soralia appear as whitish-grey convex dots containing atranorin and gyrophoric acid and reacting C+ orange-red (Fox & Purvis 1992, Mayrhofer & Moberg 2002).

Rinodina aspersa occurs in moderately well-lit to sunny habitats on siliceous rocks, stones and pebbles (e.g. shale, gneiss and flint), often in stony debris. This is a rare species in Europe distributed from southern Sweden and Finland southwards to Spain (Giralt 2001), Portugal and the islands of Corsica and Sardinia (Mayrhofer & Moberg 2002). In central Europe, it prefers climatically mild, lower elevations (Wirth 1995). It was also reported from North America (Glew 1999).

In the Czech Republic, it was reported only three times. The oldest records come from Servít (1930), who mentioned several localities from Central Bohemia: quartzite near Nižbor (PRM 855248, coll. J. Podzimek), quartz near Bohnice, schist near Křivoklát (PRM 855249, coll. J. Podzimek), Zahořany and Všenory. *R. aspersa* has recently been recorded from gneiss stones in the foothills of Šumava Mts. (Vondrák & Palice 2004) and from basalt and schist stones in the Český kras karst (Svoboda 2005). Due to its frequent sterility, it may be undercollected and locally common in suitable habitats. It is supported by numerous findings from the protected landscape area Křivoklátsko, where we have observed richly fertile populations. It should be looked for in colline-submontane woodland siliceous areas.

SPECIMENS EXAMINED: Central Bohemia: Beroun, 2 km N of Zahořany, on S-facing slope of crest NE of Lísek low hill, alt. 450 m, on scree, 20.7.2004, coll. J. Kocourková & W. v. Brackel (PRM 907194) - Beroun, W of Hýskov, S-facing rocky slope with low shrubs above railway, alt. 250 m, MTB 6050 A03, on shale, 16.3.2005, coll. J. Kocourková & W. v. Brackel (PRM 907162) - Rakovník, Křivoklát, near school, at beginning of nature trail, N 50°01'85", E 13°51'93", in oak-hornbeam forest, on S-facing slope with shaded shale scree, on shale stone, alt. 280 m, MTB 5949 C07, 31.3.2002, coll. J. Kocourková & P.

Kocourek (PRM 900082, 900084) - Praha, near Pitkovice, valley of Pitkovický potok brook, Pitkovická stráň nature reserve, at upper edge of quarry, on SW-facing slope, on low outcrop, alt. 280 m, MTB 5953, on shale, 11.6.2005, coll. J. Kocourková (PRM 907169) - Rakovník, Lány, Lánská obora game reserve, valley of Lánský brook, between the locality “U ručiček” and the lake “Drahý”, on shaded E-facing outcrop, alt. 345 m, MTB 5949 B07, on slightly metamorphosed paleobasalt, 22.11.2002, coll. J. Kocourková (PRM 900439) - Rakovník, 1 km NE of Nezabudice, Nezabudické skály rocks nature reserve, on rocky slope, alt. 280 m, MTB 5949 C11, on greywacke, 30.7.1997, coll. J. Kocourková & P. Kocourek (PRM 906664) - Ibid., 10.3.2003, coll. J. Kocourková (PRM 907192) - Rakovník, near village of Roztoky and settlement of Višňová, above right bank of Berounka River, on roadside rock, alt. 250 m, MTB 5949 C17, on rhyolite, 28.9.1997, coll. J. Kocourková (PRM 906930, in specimen of *Stigmidium fuscatae*) - Rakovník, Skryje, Jankovský mlýn water-mill in valley of “Zbizožský potok” brook, alt. 340 m, N 49°56'30”, E 13°44'55”, sunny dacite stony debris, 21.9.2004, coll. J. Vondrák, rev. Z. Palice (CBFS 2210) - Rakovník, Skřivaň, rocks in protected area “Valachov”, in valley of Tyterský potok brook, alt. 351 m, N 50°01'08.7”, E 13°46'24.6”, on basaltic pebbles in stony debris on W-exposed slope, 23.4.2005, coll. Z. Palice (hb. Palice 8782) & coll. J. Vondrák (CBFS 2832) - Rakovník, NW of Zbečno, Brdatka nature reserve, rocky slopes above Berounka River, on SSE-facing slope, thin *Quercus-Carpinus* forest, alt. 285 m, MTB 5949 C05, on exposed rocks, on shale, 30.11.2004, coll. J. Kocourková & W. v. Brackel (PRM 906846) - Ibid., 13.12.2004, coll. J. Vondrák (CBFS 2434).

Rinodina calcarea

This well characterized species is easily recognizable by its Tunicata-type ascospores. Mayrhofer & Poelt (1979) reported *Rinodina calcarea* from calcareous and lime-rich siliceous rocks in warm and dry climates of central and south Europe, Asia Minor and northern Africa. It is also known from Central Asia (Kudratov & Mayrhofer 2002, Mayrhofer 1984a). In Europe, *R. calcarea* has rather southern distribution, but it rarely occurs also in England and on the Swedish islands of Öland and Gotland (Mayrhofer & Moberg 2002).

In the Czech Republic, it has so far been reported from several sites in the Český kras karst (Černohorský 1942a, b, Svoboda 2005) and two small limestone sites in Silesia (Müller 1951).

SPECIMENS EXAMINED: Central Bohemia: Beroun, Králův Dvůr, Trubín, S-oriented rocks in protected area “Trubínský vrch”, alt. 330-350 m, N 49°56'40”, E 13°59'40”, on overhanging lime-rich basaltic rock, 25.7.2004, coll. J. Vondrák, det. H. Mayrhofer (CBFS 2377) - Praha, near Nová Ves settlement, Prokopské údolí valley, „Bílé skály“ calcareous rocks, MTB 5952, on vertical wall of rock, 13.10.1999, coll. J. Kocourková (PRM 907184) - Praha, Prokopské údolí valley, alt. 280 m, MTB 5951 C, on calcareous rocks above old swimming pool “Holyňské koupaliště”, 4.5.1988, coll. J. Horáková (PRM 907186) - Ibid., 5.5.1994, coll. J. Horáková (PRM 887772) - Praha, Hlubočepy: by street “K Dalejím”, foot of small steep S-exposed slope, alt. 240 m, on weathering calcareous schist rock, 18.4.1999, coll. Z. Palice, L. Bičanová & K. Vincencová (hb. Palice 1881) - Praha-Zlíchov, Zlíchovský kostelík, alt. 200 m, on exposed limestone outcrop, 5.5.2003, coll. Š. Bayerová, A. Müller, Z. Palice, O. Peksa & D. Svoboda (hb. Palice 6846). **South Bohemia:** Český Krumlov, Nové Dobrkovice, protected area “Vyšenské

kopce”, alt. 520-540 m, N 48°49’10”, E 14°17’50”, on sunny calcareous rocky outcrop, 26.10.2004, coll. J. Vondrák, J. Šoun & M. Bartoš (CBFS 2372). **South Moravia:** Mikulov, rocks on eastern slope of Kozí hrádek ruin, on hard limestone rock, 19.5.2004, coll. J. Vondrák, J. Šoun & M. Bartoš (CBFS 1841) – Mikulov, limestone rocks under Svätý kopeček hill, ca 0.2 km E of town, N 48°48’29”, E 16°39’00”, on NW-exposed hard limestone rock, 21.8.2002, coll. J. Vondrák (CBFS 1560).

**Rinodina castanomelodes*

Syn.: *Rinodina bischoffii* var. *castanomelodes*

The species is related to the widespread *R. bischoffii* (Bischoffii-type ascospores, inspersed hymenium) from which it differs especially by the well-developed thallus. Giralt (2001) regards the species as a variety of *R. bischoffii*, however, there exist additional morphological differences justifying the separation of these two taxa (H. Mayrhofer in litt.).

R. castanomelodes is an exclusively alpine lime-loving species and the occurrence in the Sudetes, where acidic stones predominate, refers to two nearby man-made substrates in the subalpine belt of the highest and most frequently visited Sudetian peak on the Czech/Polish borderline. Otherwise, it is known from the Alps (Mayrhofer & Poelt 1979), Pyrenees (Giralt & Llimona 1997), Tatry Mts. (Lisická 2005), mountains of Central Asia (Kudratov & Mayrhofer 2002) and North America (Esslinger 1997).

SPECIMENS EXAMINED: **Eastern Bohemia:** Krkonoše Mts. Pec pod Sněžkou, Mt. Sněžka: S-facing crest, below uppermost part of cable-car, just below top, alt. 1550-1580 m, N 50°44’10”, E 15°44’15”, on mortar of pillar, 29.8.2000, coll. Š. Bayerová, J. Liška & Z. Palice, det. Z. Palice, conf. H. Mayrhofer (hb. Palice 5203).

ADDITIONAL SPECIMEN: **Poland, Silesia:** Karkonosze Mts. Mt. Sgnieszka – top, alt. 1600 m, on horizontal flat of mortar wall, 26.7.2000, coll. Š. Bayerová, J. Liška & Z. Palice, det. Z. Palice, conf. H. Mayrhofer (hb. Palice 5031).

Rinodina occulta

This very inconspicuous lichen is characterized by small apothecia, 0.1-0.3 mm in diameter, black convex disc and exciple. The thin greyish thallus has K+ yellow reaction due to the presence of atranorin, and the ascospores are intermediate between *Physcia*-type and *Milvina*-type (cf. Fox & Purvis 1992, Mayrhofer & Poelt 1979).

R. occulta is a widespread species of vertical to underhanging siliceous rocks. Except the reports from many European countries (e.g. Berger 2000, Mayrhofer & Poelt 1979, Mayrhofer et al. 1998, Mayrhofer & Moberg 2002), it is also known from Chile (Galloway & Quilhot 1998), Papua New Guinea (Aptroot et al. 1997) and Australia (Mayrhofer 1984b). In Central Europe, *R. occulta* shows a subatlantic bias; occurs in climatically mild and humid regions growing on hard acid siliceous rocks

in hygrophilic and anitrophilic communities of *Lecanoretum orostheae* (cf. Wirth 1972, 1995).

From the Czech Republic, it was reported only twice in the 19th century. Opiz (1856) mentioned the taxon *Lecanora confragosa* b *lecideina* Flot. *fructulosa* Ach. [= *R. occulta*] from the Krkonoše Mts. (Riesengebirge, Mosig). Veselsky (1858) only reported the name *Rinodina confragosa* var. *lecideina* without any locality (probably cited record by Opiz). *R. occulta* is probably a rare species, but it may partly be overlooked due to its small sized ascocarps.

SPECIMEN EXAMINED: **West Bohemia:** Sušice, Rejštejn, rocks “Dračí skály” on right side of river Otava, 3 km SW of village, alt. 650-800 m, N 49°07'10”, E 13°30’, on SW-exposed vertical face of shaded silicate rock with *Lecanora orosthea*, 12.11.2002, coll. J. Vondrák & M. Bartoš (CBFS 795).

Rinodina pityrea

Rinodina pityrea is characterized by dark grey to black thallus, consisting of minute granules, which contain Sedifolia-grey pigment (unpublished data). This species is similar to *R. colobina*, but differs in the ascospores, which are double-walled, of the Tunicata-type. It occurs on bark of deciduous trees, rarely on wood, loess and concrete (Ropin & Mayrhofer 1995).

R. pityrea is known from Austria, British Isles, France, Germany, Italy, Poland, Slovakia, Sweden, the Czech Republic (Ropin & Mayrhofer 1995), Belgium (van den Boom et al. 1998), Spain (Giralt 2001) and the Netherlands (Giralt et al. 1997). It has only been known from three localities in the Czech Republic (Ropin & Mayrhofer 1995), East Bohemia: Ústí nad Orlicí, Černovír, on *Populus*, 1920, coll. V. Kuťák (HBG, PRM, UPS), South Moravia: Budkovice, on *Salix*, 1923, coll. J. Suza (PRM), Petrovice, on *Populus*, 1922, coll. J. Suza (PRM).

Recently collected Bohemian material of *R. pityrea* was growing mainly on concrete where the thalli may form sparsely fertile, extensive continuous coverings. Some specimens from concrete were completely sterile. Ropin & Mayrhofer (1995) particularly discuss the ecological requirements including the occurrence on concrete in some city conurbations. Corticolous populations seem to be rare and they are mostly restricted to nutrient-rich bases of trunks.

SPECIMENS EXAMINED: **Central Bohemia:** Mělník, Liběchov, wall above road between Mělník and Liběchov ca 1 km SE of village, alt. 170 m, N 50°24'30”, E 14°28’, concrete on vertical side of SW-exposed wall, 27.11.2004, coll. J. Vondrák (CBFS 2416) - Nový Knín, Velká Lečice, in valley of river Kocába NE of village, alt. 241 m, N 49°49'47.5”, E 14°20'57.5”, on sunny base of bulky trunk of *Ulmus laevis*, 30.12.2004, coll. J. Vondrák (CBFS 2514), Rakovník, Kalubice, in village, alt. 370 m, N 50°03’, E 13°49'40”, on N-exposed vertical side of concrete wall, ca 10-60 cm above ground, 9.7.2004, coll. J. Vondrák (CBFS 1986) - Rakovník, Kalubice, in village, alt. 370 m, N 50°03’, E 13°49'40”, on base of *Fraxinus excelsior* trunk, 7.1.2005, coll. J. Vondrák (CBFS 2608) - Rakovník,

Skryje, ruin of castle Týřov, alt. 295 m, N 49°58'24.6", E 13°47'24.1", on base of trunk of *Fraxinus excelsior*, 22.3.2005, coll. J. Vondrák (CBFS 2757) - Rakovník, Skryje, locality "Kouřimecká rybárna" ca 4 km NE of village, alt. 257 m, N 49°59'29.4", E 13°47'18.6", on bark of *Sambucus nigra*, 24.4.2005, coll. J. Vondrák & J. Liška (CBFS 2837) - Slapy, Štěchovice, ca 3 km W of village, alt. 225 m, N 49°50'41.7", E 14°21'49.4", on concrete fundament of hut, 30.12.2004, coll. J. Vondrák (CBFS 2599). **South Bohemia:** České Budějovice, Dubné, Habří, locality "Háječky" 1 km W of village, N 48°58'50", E 14°19'20", old mortar on wall of church ruin, 17.11.2004, coll. J. Vondrák (CBFS 2409) - Český Krumlov, Chvalšiny, in village, alt. 570 m, N 48°51'30", E 14°12', on vertical side of SW-oriented concrete wall, 4.12.2004, coll. J. Vondrák (CBFS 2419) - Prachatice, Husinec, Výřov, in village, alt. 507 m, N 49°02'56.9", E 13°59'47.9", vertical side of concrete pole, 25.12.2004, coll. J. Vondrák (CBFS 2521) - Prachatice, Těšovice, in village, alt. 420 m, N 49°03'04.2", E 14°01'21.5", on vertical side of S-exposed concrete wall, with *Caloplaca flavocitrina*, 3.1.2005, coll. J. Vondrák (CBFS 2518).

Rinodina septentrionalis

The species was reported from the Czech Republic for the first time by Palice (1999) from a locality in "Blanský les" upland (southern Bohemia). Here, we present the second record. For characters and the general distribution of *Rinodina septentrionalis* see Giralt & Mayrhofer (1995) and Mayrhofer & Moberg (2002).

SPECIMEN EXAMINED: **South Bohemia:** Kaplice, Benešov nad Černou, nearby town, alt. 630 m, on twigs of *Fraxinus excelsior*, 30.9.2004, coll. J. Vondrák, conf. H. Mayrhofer (CBFS 2310).

**Rinodina zwackhiana*

Syn.: *Rinodina murorum*, *Rinodina transsylvanica*, *Rinodina violascens*.

Rinodina zwackhiana is characterized by more or less squamulose thallus, presence of Sedifolia-grey pigment in epihymenium (K+ violet, C+ violet), interspersed hymenium and Buellia-type ascospores without a thickened wall in any developmental stage (cf. Mayrhofer & Poelt 1979). Marginal soralia might be developed (Sheard 1982).

This species has been so far reported from Austria, Germany, Italy (Mayrhofer & Poelt 1979), Poland, Slovakia (Bielczyk et al. 2004), Slovenia (Wilfling & Mayrhofer 2002), and Romania (Moruzi et al. 1967). Furthermore, it has been reported from North America (Esslinger 1997), China (Wei 1991), Mongolia (Sheard 1982) and northern Africa (Egea 1996). It grows typically under dry overhangs of calcareous, or lime enriched siliceous rocks. We found it only in three localities in South Bohemia. In all cases, it represents a predominant species in suitable microhabitats.

SPECIMENS EXAMINED: **South Bohemia:** České Budějovice, Kamenný Újezd, rocks under ruin of castle Kotek (Maškovec), 2 km W of village, alt. 420-440 m, N 48°54'05", E 14°24'20", on vertical, S-exposed and base-rich gneiss rock, 17.11.2002, coll. J. Vondrák, conf. H. Mayrhofer (CBFS 847, 848, 849) - Český Krumlov, protected area "Vyšenské kopce", alt. 520 m, N 48°49'10", E 14°17'50", on concrete and on crystalline

limestone rock, 4.2.2004, coll. J. Vondrák, rev. H. Mayrhofer (CBFS 1557, 1596) - Český Krumlov, Nové Dobrkovice, in village, alt. 520 m, N 48°49'10", E 14°17'50", on calcareous overhanging rock, 26.10.2004, coll. J. Vondrák, J. Šoun & M. Bartoš, conf. H. Mayrhofer (CBFS 2365, 2366).

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