

New or interesting records of lichens and lichenicolous fungi from Germany

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Abstract: New or interesting records of 26 lichens and 11 lichenicolous fungi are reported from Germany. More than 20 are new to various provinces (Bundesländer), mainly Sachsen-Anhalt. *Porina interjungens* is reported as new to Germany due to the discovery of the missing type of *Microglæna (Clathroporina) rivularis* which is reduced to synonymy.

Introduction

During field work on mainly epiphytic lichens in the province of Sachsen-Anhalt and in the vicinity of Erfurt (Thuringia), and during short visits to various other parts of Germany a number of interesting lichens and especially lichenicolous fungi has been found, of which the most important are listed here. Most of the lichenicolous fungi seem to be new to the various provinces but this is difficult to ascertain because of the lack of information on the occurrence of lichenicolous fungi in most parts of Germany. Records considered as new to the Harz Mountains include those not listed in SCHOLZ (1992). The new records of *Bacidia egenula*, *Parmelia pulla* var. *pokornyi* and *Porina interjungens* for the province of Sachsen-Anhalt (Sa.-Anh.) are based on herbarium specimens from Berlin (B) and Göttingen (GOET).

All collections and determinations have been made by myself unless otherwise indicated, and specimens for most of the records are located in my private herbarium.

The species

Acarospora cervina A.Massal.

Sa.-Anh.: Zeitz, grid 4938/3, on sandstone of bridge over the river Weiße Elster in Haynburg, 12.09.1992; Northern Foothills of Harz Mountains, grid 4233/1, on top of a grave-stone on Badeborn cemetery, 20.08.1992; Naumburg, grid

4836/3, grave-stone on Bad Kösen cemetery, 11.09.1992. - New to the province.

Acarospora versicolor Bagl. & Carestia

Sa.-Anh.: Harz, grid 4230/2, siliceous rocks influenced by limestone, NW of Rübeland, 16.05.1992; Naumburg, grid 4936/2, on top of a grave-stone on Siegelitz cemetery. - New to the province and Harz Mountains.

Bacidia assulata (Koerb.) Vězda

Sa.-Anh.: Harz, grid 4231/4, on *Acer pseudoplatanus* on road W of "Steinköpfe" 4 km W of Thale, 03.11.1992. - New to the province and Harz Mountains.

Bacidia delicata (Larbal. ex Leight.) Coppins

Thüringen: Erfurt, grid 5031/4, on *Salix* 1,5 km NE of Ingersleben, 10.11.1993. - New to the province and the second record for Germany but probably overlooked as already suggested by WIRTH (1992). The new record in the area of Erfurt subjected to relatively high air pollution indicates that the species can grow and fruit under such conditions and might be therefore expected to occur throughout Germany. The epiphytic lichen flora in this area consists mainly of *Lecanora conizaeoides* and only very poorly developed specimens of *Hypogymnia physodes*, *Parmelia exasperatula*, *P. sulcata*, *Pseudevernia furfuracea*, *Usnea hirta*, *Xanthoria candelaria*, *X. polycarpa*, etc.

Bacidia egenula (Nyl.) Arnold

Sa.-Anh.: Northern Foothills of Harz, grid 4132/4, on sandstone NW of Quedlinburg, leg. H. Oesterreich, 05.1948, det. Scholz 1991 (GOET). - New to the province.

Buellia griseovirens (Turner & Borrer ex Sm.) Almb.

Sa.-Anh.: Harz, grid 4231/4, Steinköpfe W of Thale on *Fagus*, 14.10.1992. - New to the province and Harz Mountains but probably overlooked.

Candelariella aurella (Hoffm.) Zahlbr. f. *smaragdula* Szatala

= f. *heidelbergensis* (Nyl.) P.James

Sa.-Anh.: Altmark, grid 3331/1, on concrete between Gladdenstedt and Jübar, 13.05.1992; Altmark, grid 3331/4, on top of a concrete post 4 km N of Brome, 13.05.1992. - On both localities together with f. *aurella*, but clearly distinguished by the citrine-green colour. In the province of Sachsen-Anhalt previously known only from the vicinity of Halle (HUNECK 1975, MÜLLER 1993).

Cercidospora ulothii Koerb.

Sa.-Anh.: Harz, grid 4231/1, on old *Lecanora* apothecia on loose siliceous stones in a former open cast iron mine "Braune Sumpf", 4 km SW of Blankenburg, 08.10.1989; Eisleben, grid 4435/3, parasitic on *Lecanora muralis* on spoil heap of Kupferschiefer (copper shale) at Hüneburg SW of Eisleben, 10.03.1991, leg. et det. H. Sipman 29888 (B), shown to the collector by Dr S. HUNECK. - New to the Harz Mountains. Already known from one record in the province made last century (HAFELLNER 1987). This species is rare in contrast to the

Cercidospora epipolytropa (Mudd) Arnold which is abundant on *Lecanora polytropa* s. l.

Clauzadea metzleri (Koerb.) Clauzade & Cl.Roux ex D.Hawksw.

Sa.-Anh.: Finne, grid 4835/3, on limestone pebbles on the ground, N of Niederholzhausen, 09.09.1992. - New to the province.

Diploicia canescens (Dicks.) A.Massal.

Sa.-Anh.: Altmark, grid 3237/4, on mortar on the northern side of the church of Krusemark, 01.07.1992; Altmark, grid 3137/4, on mortar on the church of Giesenslage, 16.07.1992. - First records for the province of Sachsen-Anhalt since the beginning of the last century (vicinity of Halle; SCHINDLER 1937).

Dimelaena oreina (Ach.) Norman

Baden-Württemberg: Ulm, on worked, horizontal, south-facing sandstone on the tower of Ulm Cathedral, 07.09.1991. - An interesting, isolated location on artificial substrate. The nearest records are from the southern part of the Black Forest, about 150 km away (WIRTH 1987).

Dirina massiliensis Durieu & Mont. f. *sorediata* (Müll.Arg.) Tehler

Niedersachsen: Harz, grid 4328/3, Steinkirche N of Scharzfeld, on shaded vertical dolomite rock, 16.10.1992. - New to the Harz Mountains.

Endococcus propinquus (Koerb.) D.Hawksw.

Thüringen: Rhön, grid 5126/3, parasitic on *Porpidia tuberculosa* (Sm.) Hertel & Knoph on basalt in the nature reserve "Öchsenberg" W of Völkershäusen, leg. A. Geithner 1991. - This record has already been briefly mentioned as "*Endococcus rugulosus* Nyl." under the name of the host in GEITHNER (1992).

Epigloea filifera Döbbeler

Thüringen: Rhön, grid 5126/3, on shaded mossy basalt in the nature reserve "Öchsenberg" W of Völkershäusen, leg. A. Geithner, 30.09.1991, teste P. Döbbeler, 01.1994. - New to the province.

Epigloea soleiformis Döbbeler

Sa.-Anh.: Harz, grid 4433/4, on mossy spoil heap of Kupferschiefer (copper shale) mine SW of Wettelrode, 15.11.1987, teste P. Döbbeler, 01.1994. - New to the province and the Harz Mountains.

Lepraria rigidula (de Lesd.) Tønnsberg

Sa.-Anh.: Harz, grid 4230/3, Elend, under overhanging siliceous rocks, 21.05.1990. Thüringen: Harz, grid 4330/4, on *Fagus* S of Sophienhof, 15.07.1988. - New to both provinces. Both specimens have been analysed and determined by H. KÜMMERLING and C. LEUCKERT, Berlin and contain atranorin, nephrosteranic acid and an additional substance.

Lichenonium xanthoriae M.S.Christ.

Mecklenburg-Vorpommern: Grid 1640/2, parasitic on *Xanthoria polycarpa* (Hoffm.) Th.Fr. ex Rieber on *Populus* in the village of Ahrenshoop, 17.10.1984. - New to the province; first mentioned for Germany by HAWKSWORTH & DIEDERICH (1991).

Microcalicium arenarium (Hampe ex A.Massal.) Tibell

Sa.-Anh.: Harz, grid 4231/4, on *Psilolechia lucida* (Ach.) M.Choisy, Steinköpfe 3 km W of Thale, 06.11.1992.

Merismatium peregrinum (Flot.) Triebel

Sachsen: Vogtland, grid 5540/1, parasitic on *Rimularia gibbosa* (Ach.) Coppins, Hertel & Rambold on quartzite, Wendelstein near Grünbach, 12.10.1990.

Parmelia pulla var. *pokorny* (Koerb.) Türk & Poelt *ined.*

Sa.-Anh.: Lower Saale Valley, grid 4336, Rothenburg (as "*Physcia aquila*"), 18.07.1891, leg. F. W. Zopf (B). - New to the province. This specimen was analysed by C. LEUCKERT and S. KRETSCHMER, Berlin and contains stenosporic acid and gyrophoric acid.

Physcia dimidiata (Arnold) Nyl.

Sa.-Anh.: First mentioned by LITTERSKI (1988), and not rare in less polluted lowland parts of the province (Fig. 1).

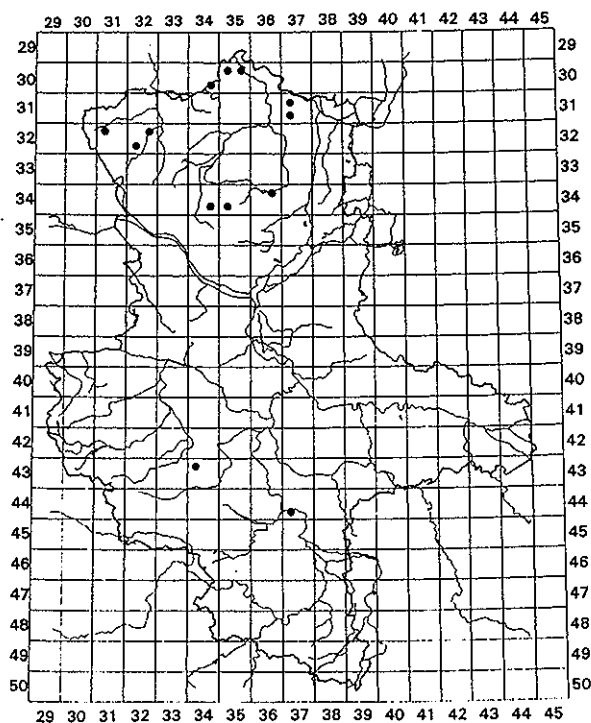


Fig. 1. Distribution of *Physcia dimidiata* in Sachsen-Anhalt.

Placopyrenium trachyticum (Hazsl.) Breuss

Sa.-Anh.: Northern Foothills of Harz Mountains, grid 4029/2, on sandstone slabs on top of the wall at the church of Hoppenstedt, 12.08.1992, det. O. Breuss. - New to the province.

Pleopsideum chlorophanum (Wahlenb.) Zopf

Baden-Württemberg: Ulm, on worked, vertical, north-facing sandstone near the top of Ulm Cathedral, 07.09.1991. Sachsen: Vogtland, grid 5540/1, on vertical quartzite on foot of Lochstein near Falkenstein, 12.10.1990. - This species has occasionally been found recently in lower montane areas in Germany (GNÜCHTEL & MÜLLER 1993) but also on worked surfaces of siliceous rocks, e. g., on a grave-stone in Northern Bavaria (WIRTH, pers. comm.) and on a roadside rock surface in Thüringen (MEINUNGER, pers. comm.), and seems to be spreading.

Polycoccum peltigerae (Fueckel) Vězda

Mecklenburg-Vorpommern: Naturpark Schaalsee, grid 2431/1, parasitic on *Peltigera didactyla* (With.) J.R.Laundon, NW of Zarrentin, 08.06.1991. - New to the province.

Polycoccum pulvinatum (Eitner) R.Sant.

Sa.-Anh.: Altmark, grid 3235/1, parasitic on *Physcia caesia* (Hoffm.) Fürnr. on a grave of the cemetery of Packebusch, 27.06.1992; Naturpark Drömling, grid 3533/3, parasitic on *Physcia caesia* on the bridge over the Weser-Elbe-Canal (Mittellandkanal) at Piplockenburg W of Mannhausen, 24.09.1992; Colbitz-Letzlinger Heide, grid 3534/3, parasitic on *Physcia caesia* on the cemetery of Roxförde, 24.09.1992. - New to Germany.

Porina interjungens (Nyl.) Zahlbr.

= *Microglæna rivularis* Zschacke (ZSCHACKE 1922: 108), *Clathroporina rivularis* (Zschacke) Zschacke in KEISSLER (1937: 389).

Sa.-Anh.: Harz, grid 4232/4, granite boulder in the brook "Kalter Bach" SW of Suderode, without date, H. Zschacke 4925 (B 71940), det. H. Mayrhofer. - New to Germany. As already mentioned in SCHOLZ (1992) the only existing specimen of *Microglæna rivularis* in B belongs to this species. The type material was not found in B during the monographic study of the European species of *Microglæna* (MAYRHOFER & POELT 1985: 68). During herbarium studies in B by the author on lichens from the Harz Mountains mainly collected by ZSCHACKE, a poorly labelled specimen was discovered. Subsequent investigating by H. MAYRHOFER, Graz found it to be conspecific with *Porina interjungens*, as had already been supposed by JØRGENSEN *et al.* (1983). Therefore, *Microglæna rivularis* is reduced here to synonymy.

Sarcogyne clavus (DC.) Kremp.

Sa.-Anh.: Harz, grid 4232/1, on cretaceous sandstone, 1 km N of Thale, 02.1992, leg. et det. G. Krebs, teste Scholz (hb. Krebs 3519). - New to the province and the Harz Mountains.

Sclerococcum sphaerale (Ach.) Fr.

Bayern: Naturpark Steinwald, grid 6038, parasitic on *Pertusaria corallina* (L.) Arnold, on granite close to the castle ruins of Weißenstein N of Friedenfels, 27.08.1993.

Stereocaulon saxatile H.Magn.

Sa.-Anh.: Harz, grid 4232/1, on sandstone 1 km N of Thale, leg. G. Krebs, 02.1992 (hb. Krebs 3516). - New to the province and the Harz Mountains. The specimen contains lobaric acid (TLC HUNECK, 1992).

Stereocaulon vesuvianum Pers.

Brandenburg: Grid 3542/3, on siliceous stone, Wachtelberg near Görz, 29.06.1991. - New to the province according to GRUMMANN (1963) but already known from Berlin (SEAWARD 1985, LEUCKERT & RUX 1988).

Stereocaulon vesuvianum Pers. var. *symphycheileoides* I.M.Lamb

Sachsen: Leipzig, grid 4740/1, on wet earthy brick under old iron railing in Markkleeberg, 01.1994. - This specimen contains atranorin and stictic acid as major compounds (TLC SIPMAN, 1994), det. H. Sipman, P. Scholz. This variety also occurs on and between old paving stones at the nearby railway station of Markkleeberg-Großstädteln. This record shows the occurrence of this species in polluted areas where it is probably not rare but easily overlooked.

Stigmidium fuscatae (Arnold) R.Sant.

Rheinland-Pfalz: Eifel, grid 5609/3, parasitic on *Acarospora fuscata* (Schrad.) Th.Fr., N of Monreal, 24.07.1993. Sa.-Anh.: Harz, grid 4332/3, parasitic on *Acarospora* cf. *fuscata* on siliceous schist, 1 km W of Silberhütte, 13.07.1988, det. P. Diederich. - New to Germany.

Stigmidium glebarum (Arnold) Hafellner

Niedersachsen: Harz, grid 4328/3, parasitic on *Toninia sedifolia* (Scop.) Timdal, Steinkirche N of Scharzfeld, 16.10.1992. Thüringen: Eichsfeld, grid 4529/3, parasitic on *Toninia sedifolia*, Gebraer Kopf SW of Bleicherode, 26.10.1991. - New to both provinces.

Thelocarpon laureri (Flot.) Nyl.

Brandenburg: Grid 3542/3, on small stones on the ground, Wachtelberg near Görz, 29.06.1991. Sa.-Anh.: Known at present from more than 50 grids. Thüringen: At present known from more than 25 records in the vicinity of Erfurt, all autumn 1993 and winter 1994. - According to HILLMANN & GRUMMANN (1957) the second record from Brandenburg, but the species is probably common and possibly spreading in most parts of Eastern Germany but is easily overlooked.

Thelomma ocellatum (Koerb.) Tibell

Sa.-Anh.: Harz, grid 4330/2, on top of a fence post, 1,5 km W of Trautenstein, 08.05.1993; Harz, grid 4231/1, on top of a fence post SW of Hüttenrode, 20.05.1993, leg. J. Poelt & P. Scholz; Altmark, grid 3137/3, on top of a fence post E of Rengerslage, 16.07.1992. - New to lowland Sachsen-Anhalt. The species seems to be not rare but has a very restricted ecology: All records (see

also SCHOLZ 1992) are on top of wooden posts, mainly oak. Always found sterile.

Trapelia placodioides Coppins & P.James

Sa.-Anh.: Altmark, grid 3435/4, on Staats cemetery, 24.07.1992. - New to the lowland area of the province.

Vouauxiella lichenicola (Linds.) Petr. & Syd.

Niedersachsen: Lüchow-Dannenberg, grid 3032/3, parasitic on *Lecanora chlarotera* Nyl. on *Fraxinus* on the cemetery of Bülitz, 21.06.1992.

Vulpicida pinastri (Scop.) Mattson & Lai

Sa.-Anh.: Altmark, grid 3035/4, on top of an old stump in agricultural area, 17.07.1992. - Very rare in the lowland area of the province.

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FT-Raman microscopic studies of *Haematomma ochroleucum* var. *porphyrium*

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Abstract: The FT-Raman spectra of thallus-substratum encrustations of the lichen *Haematomma ochroleucum* var. *porphyrium* on 18th century brickwork have been obtained successfully, despite the acknowledged fragility of this species. Spectra from the upper and lower surfaces of the encrustations are different; the spectra from the upper surface contain vibrational features which are assignable to the lichen, whereas those from the lower surface are dominated by bands arising from calcium oxalate and oxalic acid. Other features present in the vibrational spectra are ascribed to phenolic compounds from lichen metabolism.

Introduction

Most physical methods of microanalysis are based on atomic properties and thus only indirectly provide information on chemically-bonded structures. FT-Raman microscopy is a new technique for microanalytical structural investigation. An advantage of this type of laser microscopy, in addition to the very small amounts of material required for analysis, is the low laser power needed for sample illumination; non-destructive analysis is thereby achieved and this can be important for sensitive, valuable samples. In this paper a novel application of FT-Raman microscopy to the identification of chemical compounds involved in the biodeterioration of brickwork is described.

Previous Raman spectroscopic studies from our laboratories (EDWARDS *et al.* 1991, 1991b, 1992) have demonstrated the capability of the technique for the investigation of the chemical composition of lichen-substratum interfaces. Using conventional and FT-Raman spectroscopic methods, with visible and