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Lichenized and lichenicolous fungi from the Albanian Alps (Kosovo, Montenegro)

Eva A. Strasser,

Institute of Plant Sciences, NAWI Graz, Karl-Franzens-University Graz, Holteigasse 6, 8010
Graz, Austria

Josef Hafellner,

Institute of Plant Sciences, NAWI Graz, Karl-Franzens-University Graz, Holteigasse 6, 8010
Graz, Austria

Danijela Steševi ,

Faculty of Natural Sciences and Mathematics, University of Montenegro, Džordža Vašingtona bb,
81000 Podgorica, Montenegro

Fehmi Geci, and

Kosovo Agriculture Institute, Pejë, Kosovo

Helmut Mayrhofer*

Institute of Plant Sciences, NAWI Graz, Karl-Franzens-University Graz, Holteigasse 6, 8010
Graz, Austria

Abstract

396 taxa (381 species) of lichenized and 45 species of lichenicolous fungi from the upper montane, subalpine and alpine belts of the Albanian Alps (= Prokletije Mountain Range, Bjeshkët e Nemuna) are presented. 92 lichenized and 26 lichenicolous fungi are new to Montenegro, 165 lichenized and 24 lichenicolous fungi are new to Kosovo, and 25 lichenized fungi (23 species) are new for the Balkan Peninsula.

Keywords

Lichens; Balkan Peninsula; Dinarides; biodiversity; subalpine and alpine belts

Introduction

The present study is focused on the lichen flora of the Albanian Alps, a natural biome that straddles three political entities, Montenegro, Kosovo and Albania. These three regions have been studied to different extents. The lichen diversity of Montenegro was studied intensively during the last ten years resulting in four floristic treatments (Bilovitz et al. 2008, 2009,

*Corresponding author: helmut.mayrhofer@uni-graz.at.
josef.hafellner@uni-graz.at
Danijela.denist@gmail.com
fehmingeci@yahoo.com

2010, Mayrhofer et al. 2013). In addition a catalogue based on an evaluation of the floristic and taxonomic literature was published (Knežević & Mayrhofer 2009). Additions and corrections to this catalogue are nearly complete (Mayrhofer & Knežević, in prep.). Especially the mountain Lovćen and some sites in the Kotor region have been historically well studied (Servít 1931); another well explored region is the Durmitor National Park and its surroundings (Kušan 1933, Savić 2001, Žuković 2005).

Kosovo has long been the lichenologically most poorly known territory of the Balkan Peninsula, and the least studied of the three regions that make up the Albanian Alps. The first comprehensive study dealing mainly with samples from Kosovo was carried out by Szatala & Timkó (1926). Further records were provided in floristic papers such as Rechinger (1935), Mešedović (1972), Trass (1998), Dimović (2003) with an English summary by Amidžić & Jovović (2003), Obermayer (2013) and Hafellner (2014), all with a main focus on the Albanian Alps, or in taxonomic treatments such as Gyelnik (1931, 1932, 1933), Mayrhofer (1984), Llop (2010), Kukwa (2011), and Muggia et al. (2014). Many records are provided in Murati (1992, 1993) but without localities. Bejtullahu et al. (1983) and Behxhet et al. (2013) used lichens for monitoring of air pollution in Mitrovica and Prishtina regions and Di Lella et al. (2003a, 2003b, 2004), Loppi et al. (2004) and Jia et al. (2005) utilized lichens as biomonitors of depleted uranium at selected heavily shelled sites. A catalogue of the lichenized and lichenicolous fungi of Kosovo is completed (Mayrhofer et al. 2016).

The earliest records from the Albanian Alps resulted from collections made by I. Szyzysłowicz in 1886 (Zahlbruckner 1888). Further data were contributed in floristic papers by Szatala & Timkó (1926), Rechinger (1935), Schade (1954), Mešedović (1972), Poelt (1975), Dimović (2003), Bilovitz et al. (2008), Obermayer (2011), Hafellner (2014) and in several taxonomic treatments (Breuss & Berger 2012, Gaya 2009, Hafellner 1993, Mayrhofer 1984, Poelt & Hafellner 1980, Poelt & Leuckert 1976, 1991, Triebel 1989, Vondrák et al. 2012, Vondrák & Mayrhofer 2013) as well as in phytosociological papers (e. g., Lakuši 1968). Most of what we know about lichen diversity in the Albanian part of the mountain chain is included in two floristic studies (Hafellner & Kashta 2003, Svoboda et al. 2012).

The Study Area

The Albanian Alps (also called Prokletije Mountains in Montenegro or Bjeshkët e Nemuna in Albania and Kosovo) are located in the border region between Montenegro, Albania and Kosovo, and constitute the southeastern most part of the Dinaric Mountain System (Stevanović et al. 2009). The boundaries of this mountain system in Albania and Kosovo are clearly defined: from the river Drin and its tributary Valbona in Albania to the Metohija basin in Kosovo including Hajla, Žljeb and Mokra Planina in the north. The demarcation of the region in Montenegro is controversial: two regions are generally included, either Prokletije in the strict sense or Prokletije in the broad sense. Prokletije s. str. includes all mountain ridges between the river Lim in the west, the Metohija basin in the east, the Skadarsko-zetska basin in the south and the upper Ibar valley in the north, while Prokletije s. l. also includes neighbouring mountain ridges to the west such as Greben, Visitor, Zeletin, Komovi, Bjelasica and Žijovo (Knežević 1995) – we follow the latter. The highest peaks are

Maja e Jezercës in Albania (2694 m), Gjeravica in Kosovo (2656 m) and Zla Kolata in Montenegro (2534 m).

The bedrock of the central Albanian Alps is dominated by Jurassic and Triassic limestones, many of which are metamorphosed, and locally by granite and other intrusive volcanics (Hughes 2009). They can be divided into two parts, approximately along the line running from Plav Lake to the peak of Maja Sapit. The western part is composed of limestones and dolomitic limestones of Mesozoic age with occurrences of carbonate and sandstone flysch and quartz schists. The eastern part is geologically more complex. Palaeozoic phyllites and argillaceous schists are locally covered with Permian-Triassic red quartz conglomerates. The eastern part consists of phyllites and argillaceous schists while the area around Maja e Rops (2501 m) belonging to Bogi evica mountain range is composed of cataclastic granitoids (Milivojevi et al. 2008). Gjeravica consists of volcanic rocks (gabbro and diabase) from the Cretaceous period (Antonijevi et al. 1977). The northern part with Hajla and Russulija comprises limestones, dolomitic limestones and dolomites from the mid Triassic (Milosavljevi et al. 1983) as does Komovi in the west (Živaljevi et al. 1981).

In the Pleistocene, the Albanian Alps were highly glaciated. The ice extended deep into the valleys. The landscape bears all the hallmarks of glacial sculpting. The end moraines of the long glaciers formed terminal basins, now occupied by cirque lakes (Menkovi et al. 2004). According to Hughes (2009), there are at least four glaciers still present in northern Albania. They occur at relatively low altitudes of c. 2000 m, which is almost unique for such southerly latitudes in Europe. They survive because of sufficient quantities of windblown and avalanching snow (Hughes 2009, Grunewald & Scheithauer 2010).

The climate is characterized generally as continental with Mediterranean influences. At lower altitudes the average annual precipitation ranges between 1000 and 1500 mm, at higher elevations between 1500 and 2000 mm with a maximum in November and December and a minimum in July and August (Menkovi et al. 2010). Winters are cold and summers are hot, with extremes up to 40 °C (Veselaj et al. 2012).

The Albanian Alps are one of the most important centres for richness and diversity of vascular plants on the Balkan Peninsula (Stevanovi et al. 2009) including a high number of local endemics (Stevanovi et al. 2007). Together they form the phytogeographical region known as Bertiscus (Hayek 1924, Turrill 1929). According to Amidži et al. (2013) the northeastern part of the Albanian Alps, known as Metohian Prokletije, is home to 23 taxa of local endemics.

The forests in the upper montane belt are dominated by Norway spruce [*Picea abies* (L.) Karsten] with scattered fir (*Abies alba* Mill.) and are superseded gradually by forests which are characterized by two Balkan Peninsula endemic species of *Pinus*, Macedonian pine (*P. peuce* Gris.) and Bosnian pine (*P. heldreichii* Christ.); furthermore, *P. peuce* forests occur over siliceous parent material on gentle slopes with moist and deep soils, usually on north-facing sites from 1400 to 2200 m, while *P. heldreichii* occurs on calcareous substrates on south-facing, steep and rocky slopes from 1500 to 2000 m (Jankovi 1960). The vegetation above the timberline starts either with mountain pine (*P. mugo* Turra) communities or dwarf

shrub heaths with the endemic *Bruckenthalia spiculifolia*, *Vaccinium* spp., *Calluna vulgaris* and *Juniperus sibirica* and alpine grasslands dominated by *Nardus stricta* and *Poa violacea* over siliceous rock and *Sesleria juncifolia* and *Festuca pungens* on calcareous soils. These formations are highly influenced by grazing livestock especially in Kosovo.

Material and methods

The sampling sites in the upper montane, subalpine and alpine belts were chosen according to the diversity and heterogeneity of the landscape in order to achieve a broad range of different habitats with emphasis on substrates. The specimens were identified using routine light microscopy techniques with the aid of Poelt (1969), Poelt & Vězda (1977, 1981), Clauzade & Roux (1985), Wirth (1995), Wirth et al. (2013) and modern taxonomic treatments. Some of the identifications required verification by using standardized thin-layer-chromatography (TLC) following the protocols of White & James (1985) and Orange et al. (2010). The specimens are deposited in the herbarium of the Institute of Plant Sciences, Karl-Franzens-University Graz (GZU), and selected duplicates in the herbarium of the Department of Biology, University of Montenegro, Podgorica (TGU). Records of more common taxa may be based on annotations of accompanying species and therefore may not refer directly to specimens in the mentioned herbaria. The nomenclature follows Santesson et al. (2004), Nimis & Martellos (2008) or other modern treatments. The taxonomy of teloschistalean and aspicilioid lichenized fungi is in flux at this time and far from stabilized, as indicated by a large number of taxa still in need of taxonomic revision; therefore we do not follow the recently proposed splitting until a more or less complete rearrangement of at least the European species is provided. New records for Montenegro are indicated with an asterisk (*), new records for Kosovo with a ring (°), and new records for the Balkan Peninsula with a number sign (#).

List of sampling locations and collectors

Montenegro, Albanian Alps / Prokletije

1. Bogi evica, east of Plav, 42°33'59.3"N/20°02'04.5"E, 2065 m, 22.08.2009, leg. Strasser, Dragojevi & Mayrhofer
2. Bogi evica, east of Plav, steep slopes S of Hridsko Lake (Hridzko Jezero), 42°34'09"N/20°02'01.5"E, 2015 m, 22.08.2009, leg. Strasser, Dragojevi & Mayrhofer
3. Bogi evica, E of Plav, steep slopes S of Hridsko Lake (Hridzko Jezero), 42°34'11.3"N/20°02'02.6"E, 1995 m, 22.08.2009, leg. Strasser, Dragojevi & Mayrhofer
4. Bogi evica, E of Plav, above the S shore of Hridsko Lake (Hridzko Jezero), 42°34'13.5"N/20°02'06.3"E, 1985 m, 22.08.2009, leg. Strasser, Dragojevi & Mayrhofer
- 4b. Bogi evica, E of Plav, Saddle S of Krš Bogicevice, wind-exposed dwarf shrubs, 42°33'54"N/20°02'56"E, 2135 m, 22.08.2009, leg. Mayrhofer

5. Planinica, NE of akor pass, 42°40'53"N/20°00'42"E, 1890 m, 23.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
6. Planinica, NE of akor pass, SW-facing steep slopes with exposed limestone rocks, 42°40'48.5"N/20°00'47"E, 2020 m, 23.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
7. Planinica, NE of akor pass, summit, 42°40'56"N/20°00'54"E, 2065 m, 23.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
8. Planinica, NE of akor pass, NW-facing steep slope with scattered large limestone outcrops, 42°40'56"N/20°00'59"E, 1975 m, 23.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
9. Planinica, NE of akor pass, NW-facing steep slope with scattered large limestone outcrops, 42°40'54"N/20°00'50"E, 1935 m, 23.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
10. Planinica, NE of akor pass, NW-facing steep slope with scattered large limestone outcrops, 42°40'52.5"N/20°00'46"E, 1930 m, 23.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
11. Planinica, NE of akor pass, SW-facing steep slope with vertical rock outcrops, 42°40'46.8"N/20°00'44.8"E, 1915 m, 23.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
12. Grbaja, SE of Gusinje, 42°30'47"N/19°46'54"E, 1175 m, 24.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
13. Grbaja, SE of Gusinje, 42°30'30"N/19°46'42.6"E, 1230 m, 24.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
14. S of Starac, Temnja ka reka valley, c. 10 km E of Plav, siliceous rocks close to the ground in an open conifer forest along the road, 42°36'45.8"N/20°01'52.1"E, 1430 m, 25.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
15. S of Starac, Temnja ka reka valley, c. 10 km E of Plav, 42°36'48.5"N/20°02'11.7"E, 1450 m, 25.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
16. SW of the summit of Starac, Temnja ka reka valley, 42°37'13.5"N/20°03'04.8"E, 1855 m, 28.08.2009, leg. Strasser, Dragojevi & Steševi

Montenegro, Komovi Mountain Range

19. Pass Trešnjevik on the road from Mateševo to Andrijević, 42°44'07.1"N/19°41'08.9"E, 1560 m, 26.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
20. Road from the pass Trešnjevik to the Eko-Katun Štavna, along the road NE of the Eko-Katun Štavna, 42°42'57.6"N/19°41'22.5"E, 1695 m, 26.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer

Montenegro, Albanian Alps / Prokletije

21. Visitor, W of Plav, Visitorsko Jezero, *Abies alba*-*Pinus peuce* forest, 42°37'28.5"N/19°53'03.3"E, 1735 m, 27.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
22. Visitor, W of Plav, east exposed slopes with open *Pinus peuce*-*Abies alba* forest, along the track from the Visitorsko Jezero (lake Visitor) to the mountain hut below Mramorje, 42°37'22.6"N/19°52'59.3"E, 1780 m, 27.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
23. Visitor, W of Plav, E-facing open pasture with scattered trees of *Pinus peuce* above the mountain cabin, 42°37'17"N/19°53'03.2"E, 1865 m, 27.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
24. Visitor, W of Plav, saddle N of the summit of Mt Visitor, 42°36'51.2"N/19°53'03.8"E, 1940 m, 27.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
25. Visitor, W of Plav, summit of Plana peak, 42°36'36"N/19°53'11"E, 2210 m, 27.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
26. Visitor, W of Plav, W-facing steep slopes below the summit of Plana peak, 42°36'24.4"N/19°53'11.4"E, 2090 m, 27.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
27. Visitor, W of Plav, NW-facing slopes below the summit of Plana peak, 42°36'33.8"N/19°52'58.7"E, 2000 m, 27.08.2009, leg. Strasser, Dragojevi , Steševi & Mayrhofer
28. Visitor, W of Plav, Mramorje N of Mt Visitor, steep SW-facing slopes with scattered *Pinus heldreichii*, 42°37'14.8"N/19°53'9.2"E, 27.08.2009, 1940 m, leg. Strasser, Dragojevi , Steševi & Mayrhofer
29. Hajla, above the mountain cabin "Grove", E-facing slope with scattered *Pinus peuce* and limestone outcrops, 42°45'57"N/20°08'24"E, 1935 m, 14.07.2010, leg. Steševi & Mayrhofer

Montenegro/Kosovo, Albanian Alps / Prokletije

30. Hajla, summit of Mt Hajla, 42°45'26"N/20°08'21"E, 2403 m, 15.07.2010, leg. Steševi & Mayrhofer
31. Hajla, ridge SE of the summit of Mt Hajla, 42°45'20"N/20°08'30"E, 2350 m, 15.07.2010, leg. Steševi & Mayrhofer
32. Hajla, ridge SE of the summit of Mt Hajla, 42°45'19"N/20°08'36"E, 2325 m, 15.07.2010, leg. Steševi & Mayrhofer

Kosovo, Albanian Alps / Bjeshkët e Nemuna e Kosovës

33. Hajla, E-facing steep limestone rocks along the path from Mala gora to the summit of Mt Hajla, 42°45'14"N/20°08'57"E, 2240 m, 15.07.2010, leg. Steševi & Mayrhofer
34. Hajla, E-facing slopes below Mala gora with scattered *Pinus heldreichii*, 42°45'39"N/20°09'12"E, 1920 m, 15.07.2010, leg. Steševi & Mayrhofer

Montenegro/Kosovo, Albanian Alps / Prokletije

35. Maja e Bregut (green hill) E of Hajla mountain, SE-facing slopes with large siliceous boulders and scattered *Pinus peuce*, 42°46'04"N/20°09'17"E, 1930 m, 15.07.2010, leg. Steševi & Mayrhofer

Montenegro, Komovi Mountain Range

36. Summit of Vasojevi ki Kom, 42°41'16"N/19°40'22"E, 2460 m, 27.08.2011, leg. Steševi

Kosovo, Albanian Alps / Bjeshkët e Nemuna e Kosovës

37. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, northern slopes of Maja e Ropës, 42°34'48"N/20°05'43"E, 2190 m, dwarf shrub heath, siliceous soil, 21.08.2012, leg. Geci, Zekaj & Mayrhofer
38. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, northern slopes of Maja e Ropës (Maja e Rops), 42°34'42"N/20°05'50"E, 2244 m, dwarf shrub heath, siliceous rock outcrops, 21.08.2012, leg. Geci, Zekaj & Mayrhofer
39. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, NW-facing ridge of Maja e Ropës (Maja e Rops), 42°34'28"N/20°06'15.5"E, 2364 – 2369 m, open grassland, 21.08.2012, leg. Zekaj & Mayrhofer
40. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, summit of Maja e Ropës (Maja e Rops), 42°34'27"N/20°06'30"E, 2480 – 2500 m, dwarf shrub heath, siliceous rock outcrops, 21.08.2012, leg. Zekaj & Mayrhofer
41. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N-facing slopes along the ridge W of the summit of Maja e Ropës (Maja e Rops), 42°34'29"N/20°06'12"E, 2356 m, dwarf shrub heath intermixed with open grassland over siliceous parent material, 21.08.2012, leg. Zekaj & Mayrhofer
42. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N-facing slopes along the ridge W of the summit of Maja e Ropës (Maja e Rops), 42°34'29.5"N/20°06'10.5"E, 2352 m, dwarf shrub heath intermixed with open grassland over siliceous parent material, 21.08.2012, leg. Zekaj & Mayrhofer
43. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N-facing slopes along the ridge W of the summit of Maja e Ropës (Maja e Rops), 42°34'31"N/20°06'07"E, 2343 m, dwarf shrub heath intermixed with open grassland over siliceous parent material, 21.08.2012, leg. Zekaj & Mayrhofer

44. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, northern slopes of Maja e Ropës (Maja e Rops), 42°34'42"N/20°05'59.5"E, 2242 m, dwarf shrub heath with siliceous boulders and outcrops, 21.08.2012, leg. Zekaj & Mayrhofer
45. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N of Maja e Ropës (Maja e Rops), 42°35'28"N/20°05'56.5"E, 1890 m, NE-facing large siliceous boulders in open pasture and pillars of a dilapidated house, 21.08.2012, leg. Zekaj & Mayrhofer
46. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N of Maja e Ropës (Maja e Rops), 42°35'23.5"N/20°05'50.5"E, 1923 m, iron-rich siliceous boulders in open pasture along a path, 22.08.2012, leg. Zekaj & Mayrhofer
47. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N-facing slopes south of Maja e Male, near Pašin izvor, 42°34'49"N/20°05'22.5"E, 2173 m, pebbles in small stream below the spring, 22.08.2012, leg. Zekaj & Mayrhofer
48. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, E-facing slopes south of Maja e Male, 42°35'05"N/20°05'10.5"E, 2205 m, large limestone boulder in dwarf shrub heath, 22.08.2012, leg. Zekaj & Mayrhofer
49. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N-facing slopes E of Maja e Male, 42°35'16.5"N/20°05'21.5"E, 2204 m, open grassland on calcareous soil, 22.08.2012, leg. Zekaj & Mayrhofer
50. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, small depression below NE-facing steep slopes of Maja e Male, 42°35'18.5"N/20°05'18"E, 2180 m, large limestone boulders in grassland, 22.08.2012, leg. Zekaj & Mayrhofer
51. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, E-facing slopes of Maja e Male, 42°35'N/20°05'21.5"E, c. 2120 m, open grassland over calcareous soil, 22.08.2012, leg. Zekaj & Mayrhofer
52. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N-facing slopes SW of Bjeshket e Belegut, 42°35'02.5"N/20°05'34"E, c. 2050 m, dwarf shrub heath intermixed with open grassland around a spring, 22.08.2012, leg. Zekaj & Mayrhofer
53. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, N-facing slopes south of Bjeshket e Belegut, 42°35'02.5"N/20°05'52"E, c. 2020 m, dwarf shrub heath intermixed with open grassland, 22.08.2012, leg. Zekaj & Mayrhofer
54. Bogi evica, W of Deçan, summer mountain village Bjeshket e Belegut, *Pinus peuce* forest south of Bjeshket e Belegut, 42°35'05"N/20°05'59"E, c. 2000 m, on *Pinus peuce*, 22.08.2012, leg. Zekaj & Mayrhofer

55. Rusulija, SE-facing slopes south of the summit, 42°44'12"N/20°14'20"E, c. 2250 m, open rocky grassland on calcareous soil, 23.08.2012, leg. Mayrhofer, Geci & Zekaj.
56. Gjeravica, N-facing slopes below the E facing ridge, 42°31'49"N/20°09'05"E, c. 2260 m, dwarf shrub heath on siliceous soil, 24.08.2012, leg. Mayrhofer
57. Gjeravica, E-facing ridge SE of the summit, 42°31'44"N/20°08'55"E, c. 2330 m, open grassland on siliceous soil, 24.08.2012, leg. Mayrhofer
58. Gjeravica, E-facing ridge SE of the summit, 42°31'50.5"N/20°08'44.5"E, c. 2450 m, open grassland on siliceous soil and on siliceous boulders, 24.08.2012, leg. Mayrhofer
59. Gjeravica, E-facing ridge SE of the summit, 42°31'52"N/20°08'40"E, c. 2480 m, open grassland on siliceous soil, 24.08.2012, leg. Mayrhofer
60. Gjeravica, N-facing ridge close to the summit, 42°31'58"N/20°08'26"E, c. 2645 m, large siliceous boulders, 24.08.2012, leg. Mayrhofer, Geci & Zekaj
61. Gjeravica, E-facing ridge SE of the summit, 42°31'57.5"N/20°08'29.5"E, c. 2615 m, large siliceous boulders, 24.08.2012, leg. Mayrhofer, Geci & Zekaj
62. Gjeravica, small depression E of the summit, 42°31'57"N/20°09'08.5"E, c. 2160 m, siliceous pebbles in a spring, 24.08.2012, leg. Mayrhofer, Geci & Zekaj
63. Gjeravica, steep N-facing rock faces NE of the depression E of the summit, 42°32'N/20°09'17"E, c. 2120 m, siliceous rock walls and crevices, 24.08.2012, leg. Mayrhofer, Geci & Zekaj
64. Gjeravica, NE-facing slopes near the summer cottages E of the summit, 42°32'08"N/20°09'49.5"E, c. 1890 m, siliceous boulders in open pasture, 24.08.2012, leg. Mayrhofer & Zekaj

Montenegro, Albanian Alps / Prokletije

65. Bogi evica, summit of Krš Bogi evica, 42°34'20"N/20°03'29"E, c. 2374 m, 09.09.1012, leg. Steševi
66. Bogi evica, Krš Bogi evica, below the summit, 42°34'15"N/20°03'27"E, c. 2300 m, 09.09.1012, leg. Steševi
67. Bogi evica, Krš Bogi evica, below the summit, 42°34'19"N/20°03'33"E, c. 2300 m, 09.09.1012, leg. Steševi

List of substrates and their abbreviations

aqu: (semi-)inundated in a small spring

lim: on limestone

qua: on quartzite

sil: on siliceous rocks

sil-inu: inundated siliceous rock

ter-sil: on siliceous soil

ter-cal: on calcareous soil

bry: on bryophytes

deb: on plant debris

lig: on dead wood (lignum)

twi: on twigs

bark: on bark of trees

shr: on (dwarf) shrubs

Abi: on *Abies alba*

Ace: on *Acer pseudoplatanus*

Aln: on *Alnus incana*

Fag: on *Fagus sylvatica*

Jun: on *Juniperus communis*

Pic: on *Picea abies*

Pin held: on *Pinus heldreichii*

Pin mug: on *Pinus mugo*

Pin peu: on *Pinus peuce*

Sal: on *Salix* sp.

Sal ret: on *Salix retusa*

Results

Lichenized fungi

#°*Acarospora bullata* Anzi: 63 (sil)

°*Acarospora cervina* A.Massal.: 6 (lim), 7 (lim), 12 (lim), 25 (lim), 30 (lim), 33 (lim), 48 (lim), 55 (lim)

Acarospora fuscata (Nyl.) Th.Fr.: 1 (sil), 35 (qua)

Acarospora glaucocarpa (Ach.) Körb.: 7 (lim), 12 (lim)

Agonimia tristicula (Nyl.) Zahlbr.: 12 (deb), 24 (deb), 45 (deb, sub *Peltigera praetextata*)

°*Alectoria nigricans* (Ach.) Nyl.: 38 (ter-sil)

Amandinea punctata (Hoffm.) Coppins & Scheid.: 5 (lig-Pic), 29 (Pin peu), 54 (Pin peu)

- °*Amandinea punctata* f. *musciola* (Hepp ex Körb.) ined.: 43 (bry-sil)
- Anaptychia ciliaris* (L.) Körb.: 8 (lim), 14 (Pic; Aln), 54 (Pin peu)
- Arthonia fusca* (A.Massal.) Hepp: 7 (lim, sub *Caloplaca chalybaea*)
- °*Arthrorhaphis citrinella* (Ach.) Poelt: 39 (ter-sil)
- Aspicilia caesiocinerea* (Nyl. ex Malbr.) Arnold: 1 (sil), 2 (sil), 14 (gnei), 44 (sil), 64 (sil)
- Aspicilia calcarea* (L.) Körb.: 6 (lim), 7 (lim), 33 (lim), 55 (lim)
- *°*Aspicilia candida* (Anzi) Hue: 30 (lim), 33 (lim)
- Aspicilia cinerea* (L.) Körb.: 1 (sil), 14 (qua), 15 (gnei)
- Aspicilia contorta* (Hoffm.) Kremp. subsp. *contorta*: 50 (lim)
- Aspicilia contorta* subsp. *hoffmanniana* S.Ekman & Fröberg: 6 (lim)
- **Aspicilia grisea* Arnold: 65 (sil, sub *Endococcus macrosporus*)
- #*°*Aspicilia simoensis* Räsänen: 35 (qua), 60 (sil), 63 (sil)
- °*Aspilidea myrinii* (Fr.) Hafellner: 60 (sil)
- °*Bacidia bagliettoana* (A.Massal. & De Not.) Jatta: 7 (ter-cal), 49 (ter-cal), 55 (ter-cal)
- **Bacidia herbarum* (Stizenb.) Arnold: 6 (bry)
- **Bacidia subincompta* (Nyl.) Arnold: 27 (Sal ret; dea-twi)
- °*Baeomyces rufus* (Huds.) Rebent.: 30 (ter-cal), 39 (ter-sil)
- Bagliettoa baldensis* (A.Massal.) V zda: 12 (lim)
- Bagliettoa marmorea* (Scop.) Gueidan & Cl.Roux: 12 (lim)
- Bagliettoa parmigera* (J.Steiner) V zda & Poelt: 6 (lim)
- °*Bellemerea alpina* (Sommerf.) Clauzade & Cl.Roux: 40 (sil), 45 (sil), 46 (sil), 60 (sil)
- Bellemerea cinereorufescens* (Ach.) Clauzade & Cl.Roux: 63 (sil, sub *Porpidia tuberculosa*)
- **Biatora beckhausii* (Körb.) Tuck.: 14 (Aln)
- #°*Bilimbia accedens* Arnold: (63) (bry)
- °*Bilimbia lobulata* (Sommerf.) Hafellner & Coppins: 7 (ter-cal), 30 (ter-cal), 36 (ter-cal), 49 (ter-cal), 55 (ter-cal)
- Bilimbia microcarpa* (Th.Fr.) Th.Fr.: 7 (bry)
- °*Brodoa intestiniformis* (Vill.) Goward: 1 (sil), 14 (sil), 35 (qua), 40 (sil), 58 (sil), 60 (sil), 61 (sil), 67 (sil)
- °*Bryonora castanea* (Hepp) Poelt: 43 (bry)
- Bryobilimbia hypnorum* (Libert) Fryday et al.: 30 (ter-cal), 39 (ter-sil), 49 (ter-cal)

- Bryoria capillaris* (Ach.) Brodo & D.Hawksw.: 14 (Pic)
- Bryoria fuscescens* (Gyeln.) Brodo & D.Hawksw.: 2 (lig-Pin peu), 14 (Pic), 28 (Pin held), 29 (Pic), 44 (sil)
- **Bryoria nadvornikiana* (Gyeln.) Brodo & D.Hawksw.: 14 (Pic)
- °*Buellia aethalea* (Ach.) Th.Fr.: 35 (qua), 59 (sil), 63 (sil), 65 (sil)
- #**Buellia elegans* Poelt & Sulzer: 36 (ter-cal) chemotype I (TLC: atranorin only)
- *°*Buellia erubescens* Arnold: 35 (Pin peu), 45 (lig)
- Buellia griseovirens* (Turner & Borrer ex Sm.) Almb.: 2 (lig-Pin peu), 4 (lig-Pin peu, sub *Ramboldia insidiosa*), 14 (Aln)
- #°*Buellia uberior* Anzi: 59 (sil, on sterile crust)
- Calicium viride* Pers.: 2 (lig-Pin peu)
- °*Caloplaca albopruinosa* (Arnold) H.Olivier: 30 (lim)
- °*Caloplaca alociza* (A.Massal.) Mig.: 12 (lim), 30 (lim)
- *°*Caloplaca ammiospila* (Ach.) H.Olivier: 25 (bry), 30 (deb), 31 (deb), 59 (deb)
- Caloplaca arnoldiiconfusa* Gaya & Nav.-Ros.: 12 (lim)
- °*Caloplaca australis* (Arnold) Zahlbr.: 50 (lim)
- Caloplaca biatorina* (Trevis.) J.Steiner: 7 (lim)
- Caloplaca cerina* (Vain.) Zahlbr.: 1 (Jun), 7 (lig-Jun com, shr), 14 (Ace; dea-twi), 27 (Sal ret; dea-twi)
- °*Caloplaca chalybeia* (Fr.) Müll.Arg.: 7 (lim), 30 (lim), 33 (lim)
- °*Caloplaca coccinea* (Müll.Arg.) Poelt: 30 (lim, as admixture on specimen sub *Caloplaca erodens*)
- Caloplaca crenulatella* (Nyl.) H.Olivier: 8 (lim)
- #*°*Caloplaca erodens* Tretiach et al.: 30 (lim)
- °*Caloplaca herbidella* (Hue) H.Magn.: 54 (Pin peu)
- Caloplaca keissleri* (Servít) Poelt: 8 (lim)
- #*°*Caloplaca macrocarpa* (Anzi) Zahlbr.: 6 (lim), 55 (lim)
- °*Caloplaca nubigena* (Kremp.) Dalla Torre & Sarnth.: 33 (lim, sub *Diplotomma hedinii*)
- °*Caloplaca percrocata* (Arnold) J.Steiner: 50 (lim)
- Caloplaca saxicola* (Hoffm.) Nordin: 7 (lim)
- °*Caloplaca saxifragarum* Poelt: 30 (deb, sub *Lecanora hagenii* var. *fallax*), 31 (deb)

- °*Caloplaca sinapisperma* (Lam.) Maheu & A.Gillet: 7 (ter-cal), 25 (bry), 30 (bry), 55 (bry)
- °*Caloplaca stillicidiorum* (Vahl) Lynge: 1 (lig), 6 (bry), 7 (bry), 25 (bry), 30 (bry), 48 (bry)
- °*Caloplaca tirolensis* Zahlbr.: 25 (bry)
- Caloplaca variabilis* (Pers.) Müll.Arg.: 6 (lim), 7 (lim), 10 (lim), 12 (lim), 30 (lim), 50 (lim)
- Caloplaca velana* agg.: 30 (lim, sub *Weddellomyces epicallopisma*)
- °*Calvitimela armeniaca* (DC.) Hafellner: 1 (sil), 40 (sil), 44 (sil), 60 (sil)
- Candelariella aurella* (Hoffm.) Zahlbr.: 8 (lim), 12 (lim), 25 (lim; bry), 30 (ter-cal; twi-Jun), 33 (lim), 36 (lim)
- °*Candelariella reflexa* (Nyl.) Lettau: 14 (Pic; Ace), 15 (Aln), 28 (Pin hel), 29 (Pin peu), 54 (Pin peu)
- Candelariella vitellina* (Ehrh.) Müll.Arg.: 1 (sil), 7 (shr), 14 (gnei), 38 (sil), 45 (sil), 48 (lim), 59 (sil), 60 (sil), 64 (sil), 65 (sil)
- Candelariella xanthostigma* (Pers. ex Ach.) Lettau: 28 (Pin hel)
- °*Carbonea atronivea* Arnold: 50 (lim)
- Catapyrenium cinereum* (Pers.) Körb.: 7 (ter-cal), 24 (ter-cal), 25 (ter-cal), 30 (ter-cal), 36 (ter-cal), 39 (ter-sil), 42 (ter-sil), 49 (ter-cal), 50 (ter-cal), 55 (ter-cal), 59 (ter-sil)
- °*Catapyrenium daedaleum* (Kremp.) Stein: 30 (ter-cal), 42 (ter-cal), 55 (ter-cal)
- °*Cetraria ericetorum* Opiz: 7 (ter-cal), 25 (ter-cal), 30 (ter-cal), 32 (ter-cal), 36 (ter-cal), 37 (ter-sil), 40 (ter-sil), 55 (ter-cal), 57 (ter-sil), 58 (ter-sil), 59 (ter-sil)
- Cetraria islandica* (L.) Ach.: 1 (ter-sil), 7 (ter-cal), 19 (ter-sil), 23 (lig-Pin peu), 25 (ter-cal), 27 (ter-cal), 30 (ter-cal), 32 (ter-cal), 36 (ter-cal), 37 (ter-sil), 41 (ter-sil), 49 (ter-cal), 52 (ter-sil), 53 (ter-sil), 55 (ter-cal), 63 (ter-sil), 65 (ter-sil), 66 (ter-sil), 67 (ter-sil)
- Cetraria muricata* (Ach.) Eckfeldt: 4b (ter-sil), 65 (ter-sil)
- Chaenotheca chrysocephala* (Turner ex Ach.) Th.Fr.: 29 (Pin peu)
- Chrysothrix candelaris* (L.) J.R.Laundon: 2 (dea-Pin peu), 22 (Pin peu)
- Cladonia arbuscula* (Wallr.) Flot. subsp. *arbuscula*: 1 (ter-sil)
- °*Cladonia arbuscula* subsp. *mitis* (Sandst.) Ruoss: 1 (ter-sil), 39 (ter-sil), 49 (ter-cal), 53 (ter-sil), 55 (ter-cal), 65 (ter-sil), 67 (ter-sil)
- *°*Cladonia arbuscula* subsp. *squarrosa* (Wallr.) Ruoss: 30 (ter-cal), 52 (ter-sil)
- **Cladonia bacilliformis* (Nyl.) Glück: 1 (lig)
- **Cladonia borealis* S.Stenroos: 65 (ter-sil), 67 (ter-sil)
- Cladonia carneola* (Fr.) Fr.: 1 (ter-sil), 3 (lig-Pin peu)

- Cladonia cenotea* (Ach.) Schaer.: 3 (lig)
- Cladonia chlorophaea* (Flörke ex Sommerf.) Spreng.: 12 (bry), 13 (bry), 14 (bry-sil), 41 (ter-sil)
- **Cladonia coccifera* (L.) Willd.: 40 (ter-sil), 67 (ter-sil)
- Cladonia coniocraea* (Flörke) Spreng.: 14 (ter-sil)
- Cladonia crispata* (Ach.) Flot.: 1 (ter-sil)
- **Cladonia deformis* (L.) Hoffm.: 1 (lig)
- Cladonia fimbriata* (L.) Fr.: 41 (ter-sil), 43 (ter-sil)
- Cladonia furcata* (Huds.) Schrad.: 1 (ter-sil), 14 (bry; ter-sil), 19 (ter-sil)
- Cladonia gracilis* (L.) Willd. subsp. *gracilis*: 1 (ter-sil), 25 (ter-sil), 30 (ter-cal), 63 (ter-sil), 65 (ter-sil)
- **Cladonia gracilis* subsp. *elongata* (Wulfen) Vain.: 1 (ter-sil), 41 (ter-sil), 49 (ter-cal), 67 (ter-sil)
- **Cladonia macilenta* Hoffm.: 3 (Pin peu), 54 (Pin peu)
- °*Cladonia macroceras* (Delise) Ahti: 14 (ter-sil), 40 (ter-sil), 49 (ter-cal), 65 (ter-sil), 67 (ter-sil)
- **Cladonia macrophyllodes* Nyl.: 1 (ter-sil), 42 (ter-sil), 65 (ter-sil), 67 (ter-sil)
- **Cladonia phyllophora* Ehrh. ex Hoffm.: 65 (ter-sil; det. T. Ahti)
- **Cladonia pleurota* (Floerke) Schaer.: 67 (ter-sil)
- °*Cladonia pocillum* (Ach.) O.J.Rich.: 7 (ter-cal), 30 (ter-cal)
- Cladonia pyxidata* (L.) Hoffm.: 1 (ter-sil), 7 (ter-cal), 12 (ter-cal), 21 (Abi), 25 (ter-cal), 30 (ter-cal), 36 (ter-cal), 49 (ter-cal), 55 (ter-cal), 65 (ter-sil)
- **Cladonia* cf. *ramulosa* (With.) J.R.Laundon: 67 (ter-sil)
- Cladonia rangiferina* (L.) Weber ex F.H.Wigg.: 1 (ter-sil), 67 (ter-sil)
- Cladonia squamosa* (Scop.) Hoffm.: 1 (ter-sil)
- #°*Cladonia stygia* (Fr.) Ruoss: 37 (ter-sil)
- **Cladonia sulphurina* (Michx.) Fr.: 1 (ter-sil), 29 (Pin peu), 54 (Pin peu)
- °*Cladonia symphycarpa* (Flörke) Fr.: 7 (ter-cal), 25 (ter-cal), 30 (ter-cal), 36 (ter-cal), 49 (ter-cal), 50 (ter-cal), 55 (ter-cal)
- **Cladonia uncialis* (L.) Weber ex F.H.Wigg. subsp. *uncialis*: 4 (ter-sil)
- **Cladonia uncialis* subsp. *biuncialis* (Hoffm.) M.Choisy: 1 (ter-sil), 4 (ter-sil), 63 (ter-sil)
- °*Clauzadea metzleri* (Körb.) Clauzade & Cl.Roux: 8 (lim), 30 (lim)

- Collema cristatum* (L.) Weber ex F.H.Wigg.: 6 (lim), 12 (lim), 30 (lim), 33 (lim), 36 (lim)
- Collema flaccidum* (Ach.) Ach.: 55 (ter-cal)
- Collema fuscovirens* (With.) J.R.Laundon: 7 (lim), 8 (lim), 36 (lim)
- **Collema polycarpon* Hoffm. subsp. *polycarpon*: 8 (lim)
- °*Cornicularia normoerica* (Gunnerus) Du Rietz: 1 (sil), 40 (sil), 58 (sil), 60 (sil)
- #**Cyphelium pinicola* Tibell: 4 (lig-Pin peu)
- °*Dermatocarpon intestiniforme* (Körb.) Hasse: 50 (lim)
- Dermatocarpon miniatum* (L.) W.Mann: 8 (lim), 12 (lim), 36 (lim)
- Diploschistes muscorum* (Scop.) R.Sant.: 7 (ter-cal), 36 (ter-cal), 59 (ter-sil)
- Diploschistes scruposus* (Schreb.) Norman: 14 (gnei), 45 (sil)
- Diplotomma alboatrum* (Hoffm.) Flot.: 33 (lim)
- *°*Diplotomma hedinii* (H.Magn.) P.Clerc & Cl.Roux: 6 (lim), 33 (lim), 36 (lim)
- #*°*Diplotomma lutosum* A.Massal.: 30 (lim)
- °*Diplotomma nivale* (Bagl. & Carestia) Hafellner: 33 (lim)
- °*Diplotomma venustum* Körb.: 6 (lim), 8 (lim), 30 (lim), 33 (lim)
- Evernia divaricata* (L.) Ach.: 14 (Pic), 28 (Pin hel), 29 (Pin peu)
- Evernia prunastri* (L.) Ach.: 14 (bark)
- Farnoldia hypocrita* (A.Massal.) Fröberg: 12 (lim)
- °*Farnoldia jurana* (Schaer.) Hertel: 6 (lim), 8 (lim), 30 (lim), 33 (lim), 50 (lim)
- °*Farnoldia micropsis* (A.Massal.) Hertel: 33 (lim)
- Flavocetraria nivalis* (L.) Kärnefelt & A.Thell: 30 (ter-cal), 31 (ter-cal), 32 (ter-cal), 37 (ter-sil), 40 (ter-sil), 57 (ter-sil), 58 (ter-sil), 59 (ter-sil)
- **Frutidella pullata* (Norman) Schmull: 2 (lig-Pin peu)
- °*Fulgensia bracteata* (Hoffm.) Räsänen subsp. *bracteata*: 25 (ter-cal), 30 (ter-cal), 33 (ter-cal), 36 (ter-cal)
- °*Fulgensia bracteata* subsp. *deformis* (Erichsen) Poelt: 30 (ter-cal)
- °*Fuscopannaria praetermissa* (Nyl.) P.M.Jørg.: 30 (ter-cal)
- **Gyalecta foveolaris* (Ach.) Schaer.: 8 (bry)
- #°*Hymenelia ceracea* (Arnold) M.Choisy: 47 (lim-inu, sub *Staurothele areolata*)
- °*Hypocomyce scalaris* (Ach. ex Lilj.) M.Choisy: 2 (lig-Pin peu), 22 (lig), 28 (Pin hel), 29 (Pin peu), 34 (Pin held; Pin mug)
- Hypogymnia farinacea* Zopf: 2 (lig-Pin peu), 21 (Abi), 29 (Pin peu), 54 (Pin peu)

Hypogymnia physodes (L.) Nyl.: 5 (lig-Pic), 14 (Pic; Aln), 29 (Pin peu), 34 (Pin mug)

Hypogymnia tubulosa (Schaer.) Hav.: 9 (Pic), 14 (Aln), 54 (Pin peu)

*°*Lambiella furvella* (Nyl. ex Mudd) M.West & Resl: 35 (sil, on *Schaereria fuscocinerea* as admixture on specimen sub *Umbilicaria cylindrica*), 66 (sil, on *Schaereria fuscocinerea*)

*°*Lambiella insularis* (Nyl.) T.Sprib.: 35 (qua, on *Lecanora bicincta*), 38 (sil, on *Lecanora bicincta* as admixture on specimen sub *Umbilicaria cylindrica*), 40 (sil, on *Lecanora rupicola* subsp. *rupicola*)

Lecania cyrtella (Ach.) Th.Fr.: 27 (Sal ret; lig-twigg)

°*Lecania fuscella* (Schaer.) Körb.: 55 (lig)

°*Lecania inundata* (Körb.) M.Mayrhofer: 33 (lim)

#**Lecania suavis* (Müll.Arg.) Mig.: 8 (lim, sub *Caloplaca keissleri*)

°*Lecanora admontensis* Zahlbr.: 6 (lim), 33 (lim)

°*Lecanora agardhiana* Ach. subsp. *agardhiana*: 6 (lim), 33 (lim)

°*Lecanora agardhiana* subsp. *sapaudica* Clauzade & Cl.Roux var. *sapaudica*: 33 (lim)

*°*Lecanora agardhiana* subsp. *sapaudica* var. *lecidella* Clauzade & Cl.Roux: 30 (lim), 36 (lim)

Lecanora allophana Nyl.: 5 (lig-Pic)

#**Lecanora anopta* Nyl.: 5 (lig-Pic)

°*Lecanora argentata* (Ach.) Malme: 29 (Pin peu), 34 (Pin mug)

°*Lecanora bicincta* Ramond: 35 (qua), 38 (sil)

°*Lecanora cadubriae* (A.Massal.) Hedl.: 34 (lig-Pin mug, sub *Lecanora mughicola*)

Lecanora carpinea (L.) Vain.: 5 (lig-Pic), 14 (Aln; Ace)

°*Lecanora cenisia* Ach.: 14 (sil), 35 (qua), 45 (sil), 63 (sil)

Lecanora chlarotera Nyl.: 5 (lig-Pic), 14 (Aln; Ace; lig), 35 (Pin peu)

**Lecanora circumborealis* Brodo & Vitik.: 5 (lig-Pic)

Lecanora crenulata Hook.: 7 (lim)

Lecanora dispersa (Pers.) Röhl.: 1 (sil), 7 (lim), 28 (Pin hel), 29 (Pin peu), 33 (lim)

Lecanora epibryon (Ach.) Ach.: 36 (bry)

*°*Lecanora gangaleoides* Nyl.: 35 (qua)

°*Lecanora hagenii* var. *fallax* Hepp: 25 (bry), 30 (deb), 55 (bry)

Lecanora intumescens (Rebent.) Rabenh.: 14 (Aln)

°*Lecanora marginata* (Schaer.) Hertel & Rambold: 61 (sil)

*^o*Lecanora mughicola* Nyl.: 4 (lig-Pin peu), 34 (lig-twi-Pin mug), 45 (lig)

Lecanora muralis (Schreb.) M.Choisy var. *muralis*: 6 (lim), 7 (lim, sil), 8 (lim), 12 (lim), 14 (gnei), 25 (lim), 30 (lim), 45 (sil), 48 (lim)

^o*Lecanora perpruinosa* Fröberg: 50 (lim)

Lecanora polytropa (Ehrh.) Rabenh.: 1 (sil), 7 (lim), 16 (aqu-sil), 19 (sil), 35 (qua), 39 (sil), 40 (sil), 45 (sil), 58 (sil), 59 (sil), 60 (sil), 63 (sil), 64 (sil), 65 (sil), 67 (sil)

**Lecanora praesistens* Nyl.: 14 (Aln; Ace)

Lecanora pulicaris (Pers.) Ach.: 5 (lig-Pic), 14 (Aln), 29 (Pin peu), 35 (Pin peu), 54 (Pin peu)

^o*Lecanora reuteri* (Trevis.) Schaer.: 33 (lim)

^o*Lecanora rupicola* (L.) Zahlbr. subsp. *rupicola*: 1 (sil), 35 (qua), 40 (sil), 44 (sil), 59 (sil)

*^o*Lecanora rupicola* subsp. *subplanata* (Nyl.) Leuckert & Poelt: 1 (sil), 35 (qua)

**Lecanora saligna* (Schrad.) Zahlbr.: 5 (lig-Pic) 28 (Pin hel), 29 (Pin peu)

^o*Lecanora semipallida* H.Magn.: 7 (lim), 12 (lim), 36 (lim), 50 (lim)

**Lecanora swartzii* (Ach.) Ach.: 66 (sil)

Lecanora symmicta (Ach.) Ach.: 38 (lig)

Lecanora varia (Hoffm.) Ach.: 4 (lig-Pin peu), 22 (lig), 29 (Pin peu), 34 (twi-Pin mug), 35 (Pin pue), 45 (lig), 54 (Pin peu)

^o*Lecidea atrobrunnea* (DC.) Schaer.: 45 (sil), 60 (sil)

*^o*Lecidea auriculata* Th.Fr.: 1 (sil), 35 (sil)

^o*Lecidea berengeriana* (A.Massal.) Nyl.: 7 (ter-cal), 35 (ter-cal)

^o*Lecidea confluens* (Weber) Ach.: 35 (qua)

Lecidea fuscoatra (L.) Ach.: 58 (sil), 59 (sil, sub *Buellia uberior*)

Lecidea lactea Flörke ex Schaer.: 1 (sil), 38 (sil), 40 (sil), 44 (sil), 46 (sil), 60 (sil), 63 (sil), 65 (sil)

Lecidea lapicida (Ach.) Ach.: 40 (sil, sub *Calvitimela armeniaca*)

^o*Lecidea promiscens* Nyl.: 39 (sil), 40 (sil), 59 (sil)

^o*Lecidea silacea* (Hoffm.) Ach.: 63 (sil)

*^o*Lecidea umbonata* (Hepp) Mudd: 30 (lim)

Lecidella achristotera (Nyl.) Hertel & Leuckert: 5 (lig-Pic)

^o*Lecidella carpathica* Körb.: 45 (sil), 48 (lim), 64 (sil, sub *Aspicilia caesiocinerea*), 67 (sil)

Lecidella elaeochroma (Ach.) M.Choisy: 1 (Jun), 5 (lig-Pic), 7 (lig-Jun), 8 (lig; shr), 14 (Pic), 21 (Abi), 24 (lig), 27 (Sal ret; lig-twi), 29 (Pin peu), 30 (twi-Jun), 34 (twi-Pin mug), 49 (lig)

°*Lecidella euphorea* (Flörke) Hertel: 55 (lig)

°*Lecidella patavina* (A.Massal.) Knoph & Leuckert: 24 (lim), 30 (lim), 33 (lim), 36 (lim), 55 (lim)

°*Lecidella stigmata* (Ach.) Hertel & Leuckert: 6 (lim), 7 (lim), 33 (lim), 48 (lim)

°*Lecidella wulfenii* (Ach.) Körb.: 25 (bry), 30 (ter-cal), 31 (ter-cal)

*°*Lecidoma demissum* (Rutstr.) Gotth.Schneid. & Hertel: 40 (ter-sil), 67 (ter-sil)

*°*Lepraria alpina* (de Lesd.) Tretiach & Baruffo: 1 (bry), 2 (ter-sil), 60 (ter-sil), 63 (ter-sil)

#°*Lepraria borealis* Lohtander & Tønsberg: 42 (ter-sil, sub *Lepraria alpina*)

*°*Lepraria caesioalba* (de Lesd.) J.R.Laundon: 1 (ter-sil; bry), 14 (cal), 15 (gnei), 30 (ter-cal), 63 (ter-sil)

°*Lepraria eburnea* J.R.Laundon: 12 (bry), 30 (ter-cal)

Lepraria finkii (Hue) R.C.Harris: 1 (ter-sil), 14 (Aln)

#°*Lepraria humida* Slavíková & Orange: 63 (ter-sil)

#**Lepraria jackii* Tønsberg: 4 (bry)

Lepraria leuckertiana (Zedda) L.Saag: 14 (lig, sub *Micarea lignaria*)

Lepraria rigidula (de Lesd.) Tønsberg: 4 (ter), 28 (Pin hel)

°*Lepraria vouauxii* (Hue) R.C.Harris: 12 (bry), 13 (bry), 30 (lig), 34 (twi-Pin mug)

Leptogium gelatinosum (With.) J.R.Laundon: 7 (bry)

°*Leptogium imbricatum* P.M.Jørg.: 49 (bry)

**Leptogium intermedium* (Arnold) Arnold: 27 (lig-twi)

Leptogium lichenoides (L.) Zahlbr.: 12 (bry)

**Leptogium pulvinatum* (Hoffm.) Otolara: 27 (lig-twi)

Letharia vulpina (L.) Hue: 2 (lig-Pin peu), 22 (lig; Pin peu), 23 (lig-Pin peu)

Lethariella intricata (Moris) Krog: 4 (Pin peu), 28 (Pin hel)

*°*Leucocarpia biatorella* (Arnold) V zda: 30 (ter-cal)

Lobaria pulmonaria (L.) Hoffm.: 20 (Fag)

Lobothallia radiosa (Hoffm.) Hafellner: 6 (lim), 10 (lim), 12 (lim), 25 (lim), 30 (lim)

°*Megaspora verrucosa* (Ach.) Hafellner & V.Wirth var. *verrucosa*: 6 (ter-cal), 7 (ter-cal), 24 (ter-cal), 25 (ter-cal), 30 (ter-cal), 36 (ter-cal), 55 (ter-cal), 59 (ter-sil)

- °*Megaspora verrucosa* var. *mutabilis* (Ach.) Nimis & Cl.Roux: 55 (lig)
- °*Melanelia stygia* (L.) Essl.: 58 (sil)
- Melanelixia glabra* (Schaer.) O.Blanco et al.: 14 (Pic; Ace), 15 (Aln), 54 (Pin peu)
- Melanelixia glabratula* (Lamy) Sandler & Arup: 5 (lig-Pic), 14 (Aln)
- Melanelixia subaurifera* (Nyl.) O.Blanco et al.: 14 (Aln)
- Melanohalea exasperata* (De Not.) O.Blanco et al.: 35 (Pin peu)
- Melanohalea exasperatula* (Nyl.) O.Blanco et al.: 5 (lig-Pic), 35 (Pin peu)
- **Micarea lignaria* (Ach.) Hedl.: 14 (lig)
- #**Miriquidica intrudens* (H.Magn.) Hertel & Rambold: 65 (sil, on *Lecidea* sp.)
- Miriquidica nigroleprosa* (Vain.) Hertel & Rambold: 1 (sil)
- Mycobilimbia carneoalbida* (Müll.Arg.) Vitik. et al.: 7 (ter-cal)
- Nephroma resupinatum* (L.) Ach.: 21 (Abi)
- °*Ochrolechia alboflavescens* (Wulfen) Zahlbr.: 2 (lig-Pin peu), 4 (lig-Pin peu), 23 (lig-Pin peu), 28 (Pin hel), 54 (Pin peu)
- °*Ochrolechia androgyna* (Hoffm.) Arnold: 1 (bry-sil), 30 (Jun), 37 (bry-sil), 40 (bry-sil), 63 (bry-sil)
- °*Ochrolechia szatalaensis* Verseghe: 28 (Pin hel), 54 (Pin peu)
- °*Ochrolechia upsaliensis* (L.) A.Massal.: 30 (ter-cal)
- **Opegrapha dolomitica* (Arnold) Körb.: 8 (lim)
- **Ophioparma ventosa* (L.) Norman: 1 (sil)
- Orphniospora mosigii* (Körb.) Hertel & Rambold: 1 (sil)
- Parmelia saxatilis* (L.) Ach.: 2 (sil; lig-Pin peu), 7 (bry), 14 (bry), 15 (gnei), 28 (Pin hel), 29 (Pin peu), 34 (Pin hel; twi-Pin mug), 35 (qua), 44 (ter-sil), 54 (Pin peu), 66 (ter-sil)
- Parmelia sulcata* Taylor: 14 (Aln; bark; bry)
- Parmeliella triptophylla* (Ach.) Müll.Arg.: 21 (Abi)
- Parmelina pastillifera* (Harm.) Hale: 20 (Fag), 28 (Pin hel)
- °*Parmelinopsis horrescens* (Taylor) Elix & Hale: 54 (Pin peu)
- Parmeliopsis ambigua* (Wulfen) Nyl.: 1 (lig), 29 (Pin peu), 30 (Pin mug), 34 (twi-Pin mug), 54 (Pin peu)
- °*Parmeliopsis hyperopta* (Ach.) Vain.: 1 (lig), 3 (lig-Pin peu), 54 (Pin peu)
- Peltigera collina* (Ach.) Schrad.: 14 (bry), 20 (Fag)
- Peltigera degenii* Gyeln.: 14 (bry)

- Peltigera horizontalis* (Huds.) Baumg.: 19 (ter-sil)
- °*Peltigera leucophlebia* (Nyl.) Gyeln.: 52 (ter-sil), 56 (ter-sil)
- **Peltigera malacea* (Ach.) Funck: 65 (ter-sil)
- Peltigera polydactyla* (Neck.) Hoffm.: 12 (bry), 14 (bry)
- Peltigera praetextata* (Flörke ex Sommerf.) Vain.: 45 (ter-sil)
- Peltigera rufescens* (Weiss) Humb.: 1 (ter-sil), 7 (ter-cal), 14 (ter-sil), 19 (ter-sil), 25 (ter-cal), 30 (ter-cal), 36 (ter-sil), 40 (ter-sil), 48 (ter-cal), 55 (ter-cal), 59 (ter-sil), 60 (ter-sil)
- Peltigera venosa* (L.) Hoffm.: 30 (ter-cal)
- Pertusaria amara* (Ach.) Nyl.: 20 (Fag), 28 (Pin hel)
- **Pertusaria pupillaris* (Nyl.) Th.Fr.: 2 (lig-Pin peu), 14 (Aln)
- Phaeophyscia endococcina* (Körb.) Moberg: 14 (gnei)
- Phaeophyscia orbicularis* (Neck.) Moberg: 12 (lim), 14 (Pic; lig)
- Phaeophyscia sciastra* (Ach.) Moberg: 8 (lim), 12 (lim)
- °*Phaeorrhiza nimbose* (Fr.) H.Mayrhofer & Poelt: 30 (ter-cal), 36 (ter-cal)
- Phlyctis argena* (Ach.) Flot.: 14 (Aln), 21 (Abi)
- Physcia adscendens* H.Olivier: 14 (Pic abi; lig), 15 (Aln inc)
- °*Physcia albinea* (Ach.) Nyl.: 45 (sil)
- Physcia aipolia* (Ehrh. ex Humb.) Fűrnr.: 5 (lig-Pic), 14 (Pic)
- Physcia caesia* (Hoffm.) Hampe ex Fűrnr.: 6 (lim), 12 (lim), 30 (ter-cal; lim)
- °*Physcia dubia* (Hoffm.) Lettau: 1 (sil), 7 (lim), 14 (gnei; lig), 25 (lim), 30 (ter-cal; lim, sub *Arthonia epiphyscia*), 33 (lim, sub *Weddellomyces epicallopusma*), 44 (sil), 48 (ter-cal, lim)
- Physcia leptalea* (Ach.) DC.: 12 (lim)
- Physcia stellaris* (L.) Nyl.: 5 (lig-Pic), 14 (Pic; Ace; lig)
- **Physcia subalbinea* Nyl.: 15 (gnei)
- Physcia tenella* (Scop.) DC.: 5 (lig-Pic abi), 14 (Ace)
- Physconia distorta* (With.) J.R.Laundon: 14 (Pic; Ace)
- °*Physconia muscigena* (Ach.) Poelt: 30 (ter-cal), 31 (ter-cal)
- Physconia venusta* (Ach.) Poelt: 20 (Fag), 54 (Pin peu)
- Placidium pilosellum* (Breuss) Breuss: 25 (ter-cal)
- *°*Placidium squamulosum* (Ach.) Breuss: 7 (ter-cal), 8 (ter-cal), 25 (ter-cal), 50 (ter-cal), 55 (ter-cal)

- Placocarpus schaeferi* (Fr.) Breuss: 25 (lim)
- **Placynthiella oligotropha* (J.R.Laundon) Coppins & P.James: 6 (ter-cal), 25 (ter-cal)
- °*Placynthiella uliginosa* (Schr.) Coppins & P.James: 6 (ter-cal), 42 (ter-sil)
- Placynthium nigrum* (Huds.) Gray: 7 (lim), 12 (lim)
- Platismatia glauca* (L.) W.L.Culb. & C.F.Culb.: 2 (lig-Pin peu), 14 (bark), 21 (Abi), 28 (Pin hel), 29 (Pin peu), 54 (Pin peu)
- Polychidium muscicola* (Sw.) Gray: 14 (bry)
- Polysporinia simplex* (Davis) V. Zda: 59 (sil, sub *Buellia aethalea*)
- Polysporinia urceolata* (Anzi) Brodo: 7 (lim, as host of *Intralichen christiansenii*)
- **Porpidia cinereoatra* (Ach.) Hertel & Knoph: 1 (sil)
- °*Porpidia crustulata* (Ach.) Hertel & Knoph: 19 (sil), 35 (qua), 45 (sil), 52 (sil)
- Porpidia macrocarpa* (DC.) Hertel & A.J.Schwab: 39 (sil)
- °*Porpidia tuberculosa* (Sm.) Hertel & Knoph: 42 (sil), 63 (sil)
- Protoblastenia calva* (Dicks.) Zahlbr.: 8 (lim)
- Protoblastenia rupestris* (Scop.) J.Steiner: 33 (lim)
- Protopannaria pezizoides* (Weber ex F.H.Wigg.) P.M.Jørg. & S.Ekman: 30 (ter-cal), 52 (ter-sil)
- Protoparmelia badia* (Hoffm.) Hafellner: 1 (sil), 35 (qua), 40 (sil), 44 (sil), 60 (sil), 61 (sil)
- °*Protoparmelia cupreobadia* (Nyl.) Poelt: 44 (sil)
- *°*Pseudephebe pubescens* (L.) M.Choisy: 40 (sil), 60 (sil), 65 (sil), 66 (sil, sub *Parmelia saxatilis*)
- Pseudevernia furfuracea* (L.) Zopf var. *furfuracea*: 1 (lig), 5 (lig-Pic abi), 12 (bry), 14 (Pic abi), 28 (Pin hel), 29 (Pin peu), 34 (twi-Pin mug), 38 (ter-sil), 45 (lig), 54 (Pin peu)
- Pseudevernia furfuracea* var. *ceratea* (Ach.) D.Hawksw.: 2 (lig-Pin peu), 28 (Pin hel), 29 (Pin peu), 54 (Pin peu)
- Psora decipiens* (Hedw.) Hoffm.: 24 (ter-cal), 25 (bry), 30 (ter-cal), 36 (ter-cal), 49 (ter-cal)
- °*Psorinia conglomerata* (Ach.) Gotth.Schneid.: 44 (sil)
- **Pycnora praestabilis* (Nyl.) Hafellner: 28 (Pin hel)
- **Pycnora sorophora* (Vain.) Hafellner: 28 (Pin hel)
- **Pycnora xanthococca* (Sommerf.) Hafellner: 3 (lig-Pin peu)
- Ramalina capitata* (Ach.) Nyl.: 38 (sil)
- Ramalina farinacea* (L.) Ach.: 14 (bark)

- Ramalina fastigiata* (Pers.) Ach.: 14 (Ace pse), 15 (bark)
- Ramalina fraxinea* (L.) Ach.: 5 (dea-Pic abi), 14 (Ace pse), 54 (Pin peu)
- *°*Ramboldia insidiosa* (Th.Fr.) Hafellner: (all on *Lecanora varia*), 4 (lig-Pin peu), 29 (Pin peu), 54 (Pin peu)
- °*Rhizocarpon alpicola* (Wahlenb.) Rabenh.: 35 (qua), 45 (sil), 66 (sil)
- Rhizocarpon badioatrum* (Flörke ex Spreng.) Th.Fr.: 14 (gnei), 45 (sil)
- #°*Rhizocarpon carpaticum* Runemark: 45 (sil)
- Rhizocarpon distinctum* Th.Fr.: 14 (gnei)
- °*Rhizocarpon ferax* H.Magn.: 45 (sil)
- °*Rhizocarpon furax* Poelt & V.Wirth: 46 (sil, on *Tremolecia atrata*)
- Rhizocarpon geographicum* (L.) DC.: 1 (sil; qua), 14 (gnei), 26 (sil), 30 (qua), 35 (qua), 38 (sil), 40 (sil), 44 (sil), 45 (sil), 48 (qua), 60 (sil), 63 (sil), 65 (sil), 67 (sil)
- °*Rhizocarpon lavatum* (Fr.) Hazsl.: 46 (sil)
- Rhizocarpon polycarpum* (Hepp) Th.Fr.: 7 (sil), 14 (gnei), 16 (aqu-sil), 65 (sil), 66 (sil), 67 (sil)
- °*Rhizocarpon reductum* Th.Fr.: 63 (sil)
- Rhizocarpon umbilicatum* (Ramond) Flagey: 8 (lim), 30 (lim)
- Ricasolia amplissima* (Scop.) De Not.: 21 (Abi)
- °*Rinodina dubyana* (Hepp) J.Steiner: 33 (lim)
- *°*Rinodina freyi* H.Magn.: 5 (lig-Pic abi), 38 (shr), 44 (lig-shr)
- Rinodina immersa* (Körb.) Zahlbr.: 7 (lim)
- Rinodina milvina* (Wahlenb.) Th.Fr.: 1 (sil), 14 (gnei), 25 (sil), 26 (sil), 30 (qua), 45 (sil), 48 (lim), 64 (sil)
- °*Rinodina mniaraea* (Ach.) Körb. var. *mniaraea*: 49 (bry-cal)
- #*°*Rinodina mniaraea* var. *cinnamomea* Th.Fr.: 30 (bry-cal), 42 (bry-sil), 49 (bry-cal), 55 (bry-cal)
- #*°*Rinodina mniaraea* var. *mniaraeiza* (Nyl.) H.Magn.: 30 (bry-cal), 42 (bry-sil), 43 (bry-sil), 55 (bry-cal)
- **Rinodina parasitica* H.Mayrhofer & Poelt: 1 (qua, on *Rhizocarpon geographicum*)
- *°*Rinodina roscida* (Sommerf.) Arnold: 25 (bry), 30 (bry)
- Rinodina sophodes* (Ach.) A.Massal.: 14 (Aln inc)
- Romjularia lurida* (Ach.) Timdal: 8 (ter-cal), 14 (ter-cal), 27 (ter-cal), 30 (ter-cal), 36 (ter-cal), 55 (ter-cal)
- Sarcogyne regularis* Körb.: 8 (lim), 12 (lim)

- °*Schaereria fuscocinerea* (Nyl.) Clauzade & Cl.Roux: 1 (sil), 35 (qua), 38 (sil), 44 (sil), 60 (sil), 66 (sil, sub *Lambiella furvella*), 67 (sil)
- **Scoliciosporum umbrinum* (Ach.) Arnold var. *umbrinum*: 15 (gnei, on thallus of *Aspicilia cinerea*, also as admixture on specimen sub the host)
- Scoliciosporum umbrinum* var. *corticolum* (Anzi) Bagl. & Carestia: 29 (Pin peu)
- Seiophora contortuplicata* (Ach.) Fröden: 8 (lim)
- Solorina bispora* Nyl.: 36 (deb)
- *°*Solorina crocea* (L.) Ach.: 39 (ter-sil), 52 (ter-sil), 65 (ter-sil)
- Solorina saccata* (L.) Ach.: 6 (ter-cal), 11 (ter-cal), 24 (ter-cal)
- °*Sporastatia polyspora* (Nyl.) Grummann: 1 (sil), 40 (sil), 44 (sil), 63 (sil)
- °*Sporastatia testudinea* (Ach.) A.Massal.: 1 (sil), 40 (sil), 60 (sil), 61 (sil)
- Squamarina cartilaginea* (With.) P.James: 7 (ter-cal), 8 (ter-cal)
- Squamarina gypsacea* (Sm.) Poelt: 7 (ter-cal), 36 (ter-cal), 50 (lim)
- °*Staurothele areolata* (Ach.) Lettau: 47 (lim-inu), 48 (lim), 50 (lim)
- °*Stereocaulon alpinum* Laurer: 39 (ter-sil), 40 (ter-sil), 58 (ter-sil)
- Tephromela atra* (Huds.) Hafellner: 1 (sil), 38 (sil), 40 (sil, sub *Sporastatia testudinea*)
- **Tetramelas chloroleucus* (Körb.) A.Nordin: 2 (lig), 3 (lig-Pin peu), 23 (lig-Pin peu)
- **Tetramelas insignis* (Nägeli) Kalb: 36 (bry-cal), 65 (bry-sil)
- Thamnotia vermicularis* (Sw.) Schaer. var. *vermicularis*: 4b (ter-cal), 30 (ter-cal), 31 (ter-cal)
- *°*Thamnotia vermicularis* var. *subuliformis* (Ehrh.) Schaer.: 32 (ter-cal), 38 (ter-sil), 40 (ter-sil), 51 (ter-cal), 58 (ter-sil), 65 (ter-sil)
- #°*Thelidium auruntii* (A.Massal.) Kremp.: 48 (lim)
- Thelidium incavatum* Nyl. ex Mudd: 30 (lim)
- **Thelomma ocellatum* (Körb.) Tibell: 1 (lig)
- Toninia candida* (Weber) Th.Fr.: 6 (lim)
- **Toninia cinereovirens* (Schaer.) A.Massal.: 7 (lim)
- Toninia sedifolia* (Scop.) Timdal: 8 (ter-cal), 25 (ter-cal), 30 (ter-cal), 36 (ter-cal)
- °*Toninia squalida* (Ach.) A.Massal.: 45 (sil)
- **Toninia taurica* (Szatala) Oxner: 6 (ter-cal), 7 (ter-cal), 36 (ter-cal)
- °*Trapeliopsis flexuosa* (Fr.) Coppins & P.James: 34 (Pin hel)
- *°*Trapeliopsis granulosa* (Hoffm.) Lumbsch: 3 (lig), 34 (Pin hel), 65 (ter-sil), 67 (ter-sil)

- Trapeliopsis wallrothii* (Flörke ex Spreng.) Hertel & Gotth.Schneid.: 59 (ter-sil)
- °*Tremolecia atrata* (Ach.) Hertel: 46 (sil), 63 (sil)
- Umbilicaria crustulosa* (Ach.) Lamy: 1 (sil), 35 (qua), 66 (sil)
- °*Umbilicaria cylindrica* (L.) Delise: 1 (sil), 35 (qua), 38 (sil), 40 (sil), 44 (sil), 58 (sil), 60 (sil), 64 (sil), 67 (sil)
- °*Umbilicaria decussata* (Vill.) Zahlbr.: 40 (sil), 58 (sil), 60 (sil), 66 (sil)
- Umbilicaria deusta* (L.) Baumg.: 1 (sil), 14 (gnei), 35 (qua), 45 (sil), 67 (sil)
- **Umbilicaria hirsuta* (Sw. ex Westr.) Ach.: 14 (gnei)
- °*Umbilicaria nylanderiana* (Zahlbr.) H.Magn.: 44 (sil)
- **Umbilicaria polyphylla* (L.) Baumg.: 1 (sil)
- Usnea barbata* (L.) Weber ex F.H.Wigg.: 28 (Pin hel)
- Usnea dasypoga* (Ach.) Nyl.: 5 (lig-Pic abi), 14 (Pic abi), 29 (Pin peu)
- Usnea hirta* (L.) F.H.Wigg.: 45 (lig)
- Usnea intermedia* Jatta: 5 (lig-Pic abi)
- *°*Usnea lapponica* Vain.: 14 (Pic abi), 54 (Pin peu)
- Verrucaria caerulea* DC.: 36 (lim)
- °*Verrucaria dufourii* DC: 49 (lim)
- °*Verrucaria fischeri* Müll.Arg.: 50 (lim)
- °*Verrucaria funckii* (Spreng.) Zahlbr.: 52 (sil-aqu), 62 (sil-aqu)
- #**Verrucaria hydrophila* Orange: 28 (sil-aqu)
- *°*Verrucaria poeltii* (Servít) Breuss: 30 (lim)
- #**Verrucaria schindleri* Servít: 8 (lim)
- #**Verrucaria selecta* Servít: 36 (lim)
- °*Vulpicida pinastri* (Scop.) J.-E.Mattsson & M.J.Lai: 29 (Pin peu), 34 (Pin mug), 54 (Pin peu)
- Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale: 14 (gnei; ter-sil)
- Xanthoparmelia delisei* (Duby) O.Blanco et al.: 35 (qua)
- Xanthoparmelia pulla* (Ach.) O.Blanco et al.: 14 (gnei)
- Xanthoparmelia stenophylla* (Ach.) Ahti & D.Hawsw.: 40 (sil; ter-sil)
- Xanthoria elegans* (Link) Th.Fr.: 6 (lim), 7 (lim), 8 (lim), 12 (lim), 25 (lim), 30 (qua; lim), 33 (lim), 48 (lim)
- **Xanthoria fulva* (Hoffm.) Poelt & Petutschnig: 14 (lig)

- Xanthoria polycarpa* (Hoffm.) Rieber: 5 (lig-Pic abi), 14 (Pic abi), 29 (Pin peu)
- °*Xanthoria sorediata* (Vain.) Poelt: 12 (lim), 33 (lim)
- °*Xylographa parallela* (Ach.: Fr.) Fr.: 2 (lig-Pin peu), 3 (lig-Pin peu), 14 (lig), 23 (lig-Pin peu), 45 (lig), 55 (lig-Pin mug)
- Xylographa soralifera* Holien & Tønsberg: 1 (lig-Jun)
- **Xylospora caradocensis* (Leight. ex Nyl.) Bendiksby & Timdal: 23 (lig-Pin peu)

Lichenicolous fungi

- **Arthonia caerulescens* (Almq.) R. Sant.: 29 – on *Lecanora varia*
- *°*Arthonia epiphyscia* Nyl.: 30 – on *Physcia dubia*, 48 – on *Physcia dubia* (as admixture on 2 specimens sub *Xanthoria elegans*)
- °*Arthonia excentrica* Th.Fr.: 40 – on *Lepraria* on ground
- °*Arthonia galactinaria* Leight.: 48 – on *Lecanora dispersa* agg. (as admixture on specimen sub *Staurothele areolata*)
- **Arthonia protoparmeliopseos* Etayo & Diederich: 6 – on *Lecanora muralis*
- °*Arthonia varians* (Davies) Nyl.: 44 – on *Lecanora rupicola*
- **Athelia arachnoidea* (Berk.) Jülich: 5 – on *Melanohalea exasperatula*
- *°*Carbonea intrudens* (H.Magn.) Hafellner: 1 – on *Rhizocarpon geographicum* (sub *Aspicilia caesiocinerea*), 35 – on *Rhizocarpon geographicum*, 40 – on *Rhizocarpon* sp. (sub *Bellemerea alpina*)
- °*Carbonea vitellinaria* (Nyl.) Hertel: 40 – on *Candelariella* sp., 45 – on *Candelariella vitellina* (sub *Lecidella carpathica*, *Rhizocarpon geographicum* and *Umbilicaria deusta*), 48 – on *Candelariella vitellina*, 64 – on *Candelariella vitellina*
- °*Cecidonia umbonella* (Nyl.) Triebel & Rambold: 40 – on sorediate crust (sub *Sporastatia polyspora*), 44 (sub *Lecanora rupicola*), 46 – on *Lecidea lactea* (sub *Lecidea lactea*)
- °*Cecidonia xenophona* (Körb.) Triebel & Rambold: 42 – on *Porpidia tuberculosa*
- **Cercidospora cecidiiformans* Grube & Hafellner: 14 – on *Rhizocarpon geographicum* (also as admixture on specimen sub *Aspicilia caesiocinerea*)
- °*Cercidospora verrucosaria* (Linds.) Arnold: 55 – on *Megaspora verrucosa*
- **Chaenothecopsis consociata* (Nádv.) A.F.W.Schmidt: 29 – on *Chaenotheca chrysocephala*
- °*Dacampia hookeri* (Borrer) A.Massal.: 27, 36 – on *Solorina* sp.
- *°*Dactylospora urceolata* (Th.Fr.) Arnold: 30 – on *Fuscopannaria praetermissa*

- **Endococcus macrosporus* (Hepp ex Arnold) Nyl.: 1 – on *Rhizocarpon geographicum*, 35 – on *R. geographicum* (sub *Schaereria fuscocinerea*), 65 – on *R. geographicum*, 66 – on *R. alpicola*, 67 – on *R. geographicum*
- **Endococcus verrucosus* Hafellner: 1 – on *Aspicilia caesiocinerea*
- **Intralichen christiansenii* (D.Hawksw.) D.Hawksw. & M.S.Cole: 7 – on *Polysporina urceolata*
- **Lichenocodium lecanorae* (Jaap) D.Hawksw.: 1 – on *Lecanora polytropa*, 28 – on *L. saligna*, 29 – on *L. carpinea*, 33 – on *L. admontensis*
- Lichenodiplis lecanorae* (Vouaux) Dyko & D.Hawksw.: 27 – on *Caloplaca cerina*
- **Lichenosticta alcicorniaria* (Linds.) D.Hawksw.: 65 – on *Cladonia pyxidata*
- **Lichenostigma maureri* Hafellner: 12 – on *Pseudevernia furfuracea* var. *furfuracea*
- **Muellerella erratica* (A.Massal.) Hafellner & Volk.John: 7 – on *Lecanora dispersa* agg.; Anstieg vom Jakob-Paß zum Starac, kurz unter dem Gipfel, c. 2300 m, 17.7.1974, leg. J. Hafellner 585 – on *Aspicilia calcarea*
- **Muellerella pygmaea* (Körb.) D.Hawksw.: 33 – on a sterile crustose lichen, 35 – on *Lecidea* sp. (sub *Lambiella insularis*), 38 – on *Lecidea lactea*, 40 – on *Lecidea lactea*, 46 – on *Bellemerea alpina* (sub *Lecidea lactea*), 63 – on *Rhizocarpon reductum* and *Lecidea lactea*
- **Nigropuncta rugulosa* D.Hawksw.: 63 – on *Bellemerea cinereorufescens* (sub *Porpidia tuberculosa*)
- **Phacographa glaucomaria* (Nyl.) Hafellner: 40 – on *Lecanora rupicola*
- **Phacopsis lethariellae* Hafellner & Rambold: 4 – on *Lethariella intricata*
- **Phacopsis vulpina* Tul.: 22 – on *Letharia vulpina*, 23 – on *Letharia vulpina*
- **Phaeosporobolus usneae* D.Hawksw. & Hafellner: 22 – on *Letharia vulpina*. Note: the coelomycete is likely to represent an anamorphic state of *Lichenostigma maureri*.
- Plectocarpon lichenum* (Sommerf.) D.Hawksw.: 20 – on *Lobaria pulmonaria*
- **Polycoccum sporastatae* (Anzi) Arnold: 44 – on *Sporastatia polyspora*, 61 – on *S. testudinea*
- **Rhagadostoma lichenicola* (De Not.) Keissl.: 39 – on *Solorina crocea*
- **Sagediopsis fissurisedens* Hafellner: 60 – on *Aspilidea myrinii* (also as admixture on specimen sub the host)
- **Sphaerellothecium cladoniae* (Alstrup & Zhurbenko) Hafellner: 36 – on *Cladonia pyxidata*, 65 – on *C. borealis* and *C. macrophyllodes*, 67 – on *C. macrophyllodes*
- **Sphaerellothecium propinquellum* (Nyl.) Cl.Roux & Triebel: 29 – on *Lecanora* sp.
- **Stigidium congestum* (Körb.) Triebel: 14 – on *Lecanora chlorotera*
- **Stigidium gyrophorarum* (Arnold) D.Hawksw.: 60 – on *Umbilicaria cylindrica*

- *°*Stigmidium mycobilimbiae* Cl.Roux et al.: 7 – on *Bilimbia microcarpa* (sub *Caloplaca stillicidiorum*), 49 – on *Bryobilimbia hypnorum* (sub the name of the host and as admixture on specimen of *Catapyrenium cinereum*)
- °*Stigmidium pumilum* (Lettau) Matzer & Hafellner: 45 – on *Physcia albinea*
- *°*Thamnogalla crombiei* (Mudd) D.Hawksw.: 4b – on *Thamnolia vermicularis* var. *vermicularis*, 38 – on *Thamnolia vermicularis* var. *subuliformis*
- **Tremella hypogymniae* Diederich & M.S.Christ: 14 – on *Hypogymnia physodes*
- **Vouauxiella lichenicola* (Linds.) Petr. & Syd.: 14 – on *Lecanora chlarotera*, 29 – on *Lecanora pulicaris*
- °*Weddellomyces epicallopisma* (Weddell) D.Hawksw.: 33 – on *Caloplaca velana* agg.
- **Zwackhiomyces sphinctrinaeformis* Grube & Hafellner: 36 – on *Romjularia lurida* (sub host)

Discussion

719 taxa (701 species, 8 subspecies, 9 varieties and 1 forma) of lichenized fungi and 18 taxa of lichenicolous fungi were previously known from Montenegro (Knežević & Mayrhofer 2009, Mayrhofer & Knežević, in prep.). We are able to add a further 92 taxa (84 species, 4 subspecies and 4 varieties) of lichenized fungi and 26 species of lichenicolous fungi. Therefore the currently known lichen biota consists of 812 taxa (786 species) of lichens and 44 lichenicolous fungi. More than 70 % of the lichenized taxa added by our contribution are crustose and many of them are widely distributed in the Alps of Central Europe and the high mountains of the Balkan Peninsula. The habitat preferences of the newly reported taxa are more or less equally divided among saxicolous, muscicolous or terricolous and corticolous or lignicolous taxa.

We have been able to add 165 taxa (156 species, 4 subspecies, 4 varieties and 1 forma) of lichenized fungi and 24 lichenicolous fungi to the 287 species of lichenized fungi previously known from Kosovo (Mayrhofer et al. 2016). Of the newly recorded lichenized taxa, c. 78 % are crustose; concerning the substrate ecology, 50 % of the added taxa are saxicolous, 37 % are muscicolous or terricolous and only 13 % are corticolous or lignicolous. The relatively low numbers of corticolous or lignicolous taxa are mainly the result of the selected sampling above the tree line. Taking into consideration the number of known taxa from Montenegro, Albania (Svoboda et al. 2012), Macedonia (Mayrhofer et al. 2013) and Bosnia and Herzegovina (Bilovitz & Mayrhofer 2011) we expect, that with this contribution, about half of the diversity of lichenized and most probably only 10 % of the lichenicolous fungi have been recorded for this region.

New lichen species for the Balkan Peninsula on limestone are *Caloplaca erodens*, *C. macrocarpa*, *Diplotomma lutosum*, *Hymenelia ceracea*, *Lecania suavis*, *Thelidium auruntii*, *Verrucaria schindleri* and *V. selecta*, on siliceous rocks *Acarospora bullata*, *Aspicilia simoensis*, *Buellia uberior*, *Miriquidica intrudens*, *Rhizocarpon carpaticum* and *Verrucaria hydrophila*, on soil, bryophytes and plant remnants *Bilimbia accedens*, *Buellia elegans*,

Cladonia stygia, *Lepraria borealis*, *L. humida*, *L. jackii*, *Polyblastia tatrana*, *Rinodina mniaraea* var. *cinnamomea* and *R. mniaraea* var. *mniaraeiza*, and on lignum *Cyphelium pinicola* and *Lecanora anopta*.

The biota of lichenicolous fungi is comparable to that of a central European mountain chain and we expect a similar diversity. The still low number of taxa is mainly due to the fact that lichenicolous fungi were not the focus of our field work. Most of the species here reported were detected as admixtures on lichen specimens.

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Fig. 1.
Bogicevi a mountain chain: The *Pinus peuce* forest around Lake Hridsko is the site (locations: 1 to 4) of the following new species for the Balkan Peninsula: *Cyphelium pinicola*, *Lepraria jackii* and the lichenicolous fungus *Phacopsis lethariellae* on *Lethariella intricata*. In addition *Letharia vulpina* is common on *Pinus peuce*, the only host phorophyte in the Albanian Alps.

Fig. 2.
Hajla with *Pinus mugo* in the foreground: The ridge is the border between Kosovo and Montenegro and is the site (locations: 30 to 33) of the new following taxa for the Balkan Peninsula: *Caloplaca erodens*, *Diplotomma lutosum*, *Polyblastia tatrana*, *Rinodina mniaraea* var. *cinnamomea* and *Rinodina mniaraea* var. *mniaraeiza*.

Fig. 3.

Bogicevi a mountain chain, Maja e Ropës: The ridge and the north-facing slopes above the summer mountain village Bjeshket e Belegut is the site (locations: 37 to 47) of the new following taxa for the Balkan Peninsula: *Cladonia stygia*, *Hymenelia ceracea*, *Lepraria borealis*, *Rhizocarpon carpaticum*, *Rinodina mniaraea* var. *cinnamomea* and *Rinodina mniaraea* var. *mniaraeiza*.