

Lichens recorded in the surroundings of Sajathütte and Eisseehütte (Hohe Tauern, Austria) in 2022

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Abstract: MALÍČEK, J., PALICE, Z., BOUDA, F., PEKSA, O., STEINOVÁ, J., SYROVÁTKOVÁ, L. & VONDRÁK, J. 2024. Lichens recorded in the surroundings of Sajathütte and Eisseehütte (Hohe Tauern, Austria) in 2022. – *Herzogia* 37: 300–319.

Four days of lichenological excursions in the surroundings of Sajathütte and Eisseehütte (Prägraten, High Tauern) resulted in the list of 428 lichen taxa, 13 lichenicolous fungi and 2 lichen-associated fungi. Five species (*Catillaria* cf. *nigroisidiata*, *Micarea fennica*, *Microcalicium loraasii*, *Placynthium pulvinatum* and *Rinodina* cf. *calcigena*) are first records for the Alps. In addition to the taxa mentioned, a further ten lichens are new to Austria: *Caloplaca approximata*, *C. fuscorufa*, *Candelariella aggregata*, *Halecania spodomela*, *Lempholemma cladodes*, *L. isidioides*, *Porina rosei*, *Protoparmelia leproloma*, *Protoparmeliopsis bolcana*, and *Stereocaulon capitellatum*. The area harbours an extraordinarily rich lichen diversity. The combination of high-mountain elements with continental or even xerothermic species is remarkable.

Zusammenfassung: MALÍČEK, J., PALICE, Z., BOUDA, F., PEKSA, O., STEINOVÁ, J., SYROVÁTKOVÁ, L. & VONDRÁK, J. 2024. Flechten in der Umgebung der Sajathütte und Eisseehütte (Hohe Tauern, Österreich) im Jahr 2022. – *Herzogia* 37: 300–319.

Im Rahmen von vier lichenologischen Exkursionstagen in der Umgebung der Sajathütte und der Eisseehütte (nordwestlich von Prägraten, Hohe Tauern) wurden 428 Flechentaxa, 13 lichenicole Pilze und 2 flechtenassoziierte Pilze nachgewiesen. Fünf Arten (*Catillaria* cf. *nigroisidiata*, *Micarea fennica*, *Microcalicium loraasii*, *Placynthium pulvinatum* und *Rinodina* cf. *calcigena*) gelten als Neufunde für die Alpen. Zusätzlich zu den genannten Sippen sind folgende zehn Flechten neu für Österreich: *Caloplaca approximata*, *C. fuscorufa*, *Candelariella aggregata*, *Halecania spodomela*, *Lempholemma cladodes*, *L. isidioides*, *Porina rosei*, *Protoparmelia leproloma*, *Protoparmeliopsis bolcana* und *Stereocaulon capitellatum*. Das Gebiet beherbergt eine außerordentlich reiche Flechtentvielfalt, wobei die Kombination von Hochgebirgselementen mit kontinentalen oder sogar xerothermen Arten besonders bemerkenswert ist.

Key words: arctic-alpine lichens, biodiversity, continental lichens, Eastern Alps, Tyrol.

Introduction

In summer 2022, Czech lichenologists in cooperation with Austrian and German lichenologists organized a workshop focused on high-mountain lichens. The meeting took place in the Sajathütte (2550 m a.s.l.) in Hohe Tauern Mts. This mountain hut is located just next to the border of Hohe Tauern National Park. Therefore, some of the records come from the national park area. The surroundings of Sajathütte are formed mainly by grazed alpine meadows and rocks. Larch forests grow closer to Hinterbichl and reach up to 1800–2150 m a.s.l. The geological bedrock is very rich, formed mainly by various calcareous silicates, such as prasinite (= calcium-rich greenschist) and calcareous mica schist, but acidic silicates, such as mica schist and phyllite, are also intermixed. The results from the workshop are summarized in this article.

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Material and methods

The area was explored within four days 26–29th July 2022. A few additional records come from a pre-excursion on the 6th July 2021. We explored the area of the national park and its immediate surroundings. Due to the difficult identification of many species, most of the records are based on voucher collections. The herbarium specimens are deposited in the herbaria of the Czech Academy of Sciences in Průhonice (PRA), Faculty of Sciences at the Charles University (PRC), the National Museum in Prague (PRM), the Museum of West Bohemia in Plzeň (PL), and in the personal herbarium of J. Malíček. In total, we present here 986 floristic records, which are available online as the electronic appendix.

Specimens were identified using standard lichenological methods, including TLC analyses (ORANGE et al. 2010) and barcoding of DNA sequences (nrITS and mtSSU). We newly produced 14 nuclear ITS and 15 mitochondrial SSU sequences (Table 1), following methods by MALÍČEK et al. (2020). DNA was isolated by the ISOLATE II RNA Plant Kit (Bioline) according to the manufacturer's protocol. Species selected for the DNA barcoding could either not be identified to species level by other methods (most cases) or they had no sequences in the GenBank. A standard nucleotide BLASTN search (ALTSCHUL et al. 1990) was used to confirm the identity of the species. The nomenclature follows NIMIS et al. (2018); taxa not included are followed by author abbreviations.

Table 1. GenBank Accession numbers and voucher information for sequenced specimens.

Taxon	Specimen	ITS	mtSSU
<i>Acarospora</i> aff. <i>praeruptorum</i>	Malíček 16690	PQ483920	-
<i>Acarospora badiofusca</i>	Malíček 15347	PQ483921	PQ483934
<i>Acarospora</i> cf. <i>intermedia</i>	Malíček 16676	-	PQ483935
<i>Acarospora</i> sp.	Malíček 15349	PQ483922	PQ483936
<i>Arthonia</i> cf. <i>apotheciorum</i>	Malíček 16689	-	PQ483937
<i>Caloplaca paulii</i>	Malíček 16609	PQ483923	PQ483938
<i>Circinaria</i> cf. <i>calcareae</i>	Malíček 16186	-	PQ483939
<i>Fuscopannaria</i> aff. <i>praetermissa</i>	PRA-Vondrák 27772	PQ483924	PQ483940
<i>Lecanora dispersoareolata</i>	Malíček 16618	PQ483925	PQ483941
<i>Lecanora lojkaeana</i>	Malíček 16641	-	PQ483942
<i>Lecidella stigmatea</i>	Malíček 16689	PQ483926	-
<i>Melanohalea elegantula</i> s.l.	Malíček 15345 (saxicolous!)	PQ483927	PQ483943
<i>Microcalicium loraasii</i>	Malíček 16693	-	PQ483944
<i>Placynthium asperellum</i>	Malíček 16614	PQ483928	-
<i>Rhizoplaca</i> cf. <i>subdiscrepans</i>	Malíček 16629	PQ483929	-
<i>Scytinium</i> sp.	PRA-Vondrák 27701	PQ483930	PQ483945
<i>Stereocaulon capitellatum</i>	Malíček 16663	PQ483931	PQ483946
<i>Umbilicaria cinereorufescens</i>	Malíček 16615	PQ483932	PQ483947
<i>Umbilicaria ruebeliana</i>	Malíček 16613	PQ483933	PQ483948

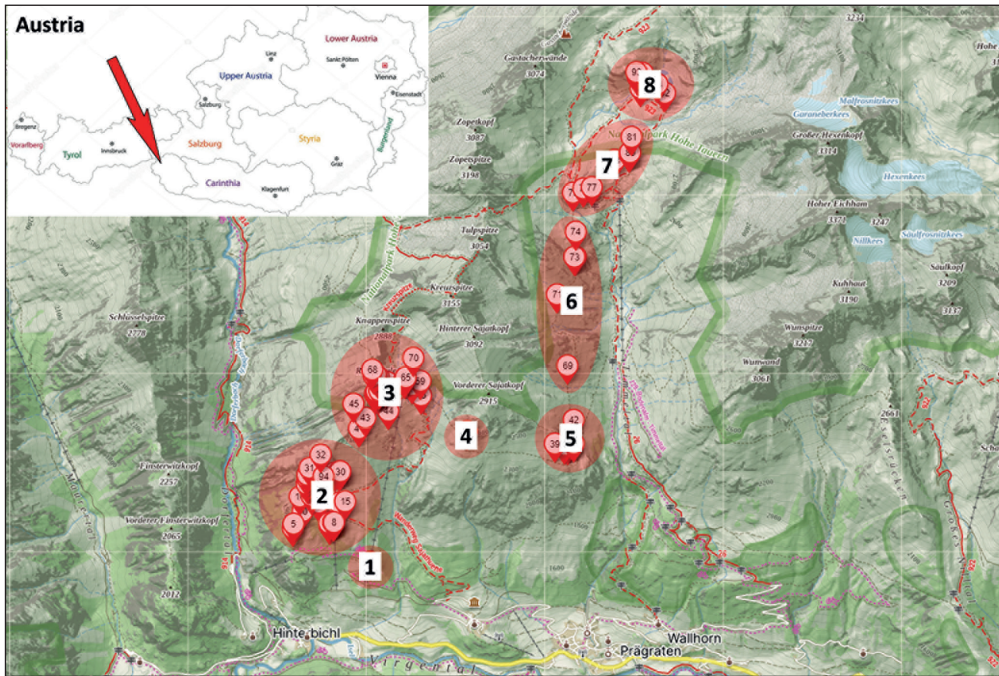


Fig. 1. Studied localities, including all 93 GPS points. Map base: Mapy.cz & Depositphotos.com.

Study sites (Fig. 1)

1. forest area on a S-facing slope between Hinterbichl and Rote Säule, just north of Frösach, approx. 500 m from the parking place, 47.02272N/12.34916E, alt. 1510 m (1 record, 1 species)
2. forests, alpine meadows, prasinite, and calcareous mica schist rocks on steep S–SW-facing slopes of Mt Rote Säule, Katinmäder, 0.7–1.5 km from Hinterbichl, 47.02839N/12.34265E (± 400 m), alt. 1775–2150 m (226 records, 146 species)
3. surroundings of Sajathütte and S-facing prasinite and calcareous mica schist rocks below Mt Rote Säule, 47.03715N/12.35173E (± 400 m), alt. 2350–2760 m (335 records, 176 species)
4. small prasinite rock outcrop along tourist path on a S-facing slope of Mt Vorderer Sajatkopf (2915 m), 47.03369N/12.36103E, alt. 2410 m (1 record, 1 species)
5. S–E-facing alpine meadows with prasinite rock outcrops 1 km SE of Mt Vorderer Sajatkopf (2915 m), along path to Eisseehütte, 47.03342N/12.37383E (± 150 m), alt. 2290–2330 m (56 records, 43 species)
6. E-facing prasinite and calcareous mica schist rock outcrops and alpine grasslands along tourist path 0.5–2.0 km SSW of Eisseehütte, 47.04526N/(12.37336E (± 800 m), alt. 2350–2500 m (13 records, 13 species)
7. alpine heath, grasslands and mostly prasinite rock outcrops in the surroundings of Eisseehütte, 47.05596N/12.37814E (± 400 m), alt. 2490–2625 m (45 records, 44 species)
8. calcareous and acidic mica schist rocks in the surroundings of Eisseehütte, 47.06296N/12.38377E (± 200 m), alt. 2650–2725 m (308 records, 204 species)

Results and species list

Within our excursions, we recorded 443 taxa: 428 lichen taxa, 13 taxa of lichenicolous fungi and 2 lichen-associated fungi. The species list is predominated by saxicolous lichens (ca. 270 species). The rest is composed of epiphytic, epixylic and terricolous lichens. 15 species are new to Austria, including 5 species new to the Alps. These are commented at the end of the species list.

Substrate abbreviations: **as** – acidic soil, **bryo** – bryophytes, **Cal** – *Calluna vulgaris*, **cs** – calcareous soil, **dw** – dead wood, **epi** – epiphytic, **hum** – humus, **Jna** – *Juniperus communis* subsp. *nana*, **Jsab** – *Juniperus sabina*, **Lar** – *Larix decidua*, **lich** – lichen, **pr** – plant residues, **s** – soil, **sx** – saxicolous, mainly on prasinite or calcareous mica schist rock.

Other abbreviations: # – lichenicolous, lichen-associated or lichen-allied fungus; **FB** – voucher collected by F. Bouda and deposited in PRM, **JM** – coll. by J. Malíček and deposited in his herbarium, **JS** – coll. by J. Steinová and deposited in PRC, **JV** – coll. by J. Vondrák and deposited in PRA, **OP** – coll. by O. Peksa and deposited in PL; **ZP** – coll. by Z. Palice and deposited in PRA; * – specimen tested by thin-layer chromatography; ! – DNA sequenced.

- Acarospora badiofusca* – 2 (sx) JM, 3 (sx) JM!, 5 (sx) JM, 8 (sx) JV
Acarospora cervina – 3 (sx) JV
Acarospora cf. *intermedia* – 3 (sx) JM!
Acarospora aff. *praeruptorum* – 2 (sx) JM!
Acarospora privigna – 3 (sx) JM, 8 (sx) JV
Acarospora sinopica – 7 (sx) JM
Acarospora sp. – 3 (lich-sx: on *Dimelaena oreina*) JM! (dispersed brown C–squamules)
Acolium inquinans – 2 (Lar) FB
Adelolecia pilati – 8 (sx) JV
Agonimia gelatinosa – 8 (s) JV
Agonimia globulifera – 3 (bryo-s) JV
Agonimia tristicula – 3 (bryo-s, pr, bryo-sx, s) JV, ZP
Alectoria nigricans – 8 (s) JV
Alectoria ochroleuca – 3 (s), 8 (s) JV
Allocetraria madreporiformis – 3 (bryo, cs, s, hum-sx, pr-cs) FB, JM, OP, ZP*, 8 (s) JV
Amandinea punctata – 2 (dw, dw-Lar, Lar, sx) JV, ZP
Anaptychia bryorum – 2 (bryo-sx) JM, 8 (bryo-s) JV
Arthonia cf. *apotheciorum* (A. Massal.) Almq. (#) – 2 (lich-sx: on *Lecidella stigmatea*) JM!
Arthonia protoparmeliae Etayo (#) – 3 (lich-sx: on *Protoparmelia badia*) ZP
Arthonia varians (Davies) Nyl. (#) – 3 (lich-sx: on *Lecanora rupicola*) JM
Arthrorhaphis alpina agg. – 3 (as) JM, 8 (s) JV
Aspicilia cf. *verrucigera* – 3 (sx) JM
Aspicilia supertegens – 8 (sx) JV
Atla alpina – 8 (sx) JV
Baeomyces placophyllus – 8 (cs-sx, s) ZP, JV
Bellemeria alpina – 8 (sx) JV
Bellemeria cinereorufescens – 5 (sx) JV
Bellemeria diamarta – 7 (sx) FB, JM, JS
Biatora chrysantha – 2 (bryo-sx, dw-Lar, Lar) JM, ZP
Biatora subduplex – 8 (bryo-s) JV
Bilimbia accedens – 3 (pr-cs) JM, 6 (bryo-cs) JM
Bilimbia lobulata – 3 (bryo-cs, cs, cs-sx, s) JM, JV, OP*, ZP, 6 (bryo-cs) JM
Bilimbia microcarpa – 8 (epi) JV
Bilimbia sabuletorum – 8 (bryo-s, s) JV
Bilimbia cf. *sabuletorum* – 3 (bryo-cs, pr) JM, ZP

- Blennothallia crispa* – 3 (cs) JM, 8 (s) JV
Botryolepraria lesdainii – 2 (sx, bryo-sx, cs) ZP
Brodoa atrofusca – 5 (sx), 7 (sx) ZP, 8 (sx) JV
Brodoa intestiniformis – 3 (sx) FB, 8 (sx) JV
Bryobilimbia hypnorum – 7 (pr) ZP, 8 (bryo-s) JV
Bryodina rhypariza – 8 (s) JV
Bryoria bicolor – 2 (dw-Lar) JV, 8 (s) JV
Bryostigma muscigenum – 8 (bryo-s) JV
Buellia arborea – 2 (dw-Lar) JV
Buellia arnoldii – 2 (dw-Lar) FB
Buellia cf. *epigaea* – 3 (s) OP*
Buellia elegans (Fig. 2A) – 3 (cs, s) FB, JM, OP, 8 (s) JV
Buellia leptocline – 3 (sx) ZP*
Buellia schaereri – 2 (Lar) JV
Buellia uberior – 5 (sx) ZP
Calicium pinicola – 2 (dw-Lar) JV, ZP
Calicium tigillare – 2 (dw-Lar) FB, JV, OP
Calicium trabinellum – 2 (dw-Lar) JV
Caloplaca ammiospila – 3 (bryo) OP, 6 (pr, bryo-cs) JM, 7 (bryo, pr) JV, ZP, 8 (bryo-s) JV
Caloplaca anchon-phoeniceon – 3 (sx) JV, 5 (sx) JV
Caloplaca approximata (new for Austria; fig. 3A) – 8 (sx) JV
Caloplaca bryochryson – 3 (cs) JM, 8 (sx) JV
Caloplaca castellana – 2 (sx) FB, ZP, 3 (sx) JV, 5 (sx) JV, 8 (sx) JV
Caloplaca conversa – 2 (sx) JV, ZP
Caloplaca epiphyta – 8 (s) JV
Caloplaca epithallina – 2 (lich-sx: on *Rhizoplaca chrysoleuca*) JM, JV
Caloplaca flavocitrina – 2 (sx) ZP
Caloplaca flavovirescens – 2 (sx) JM, 3 (sx)
Caloplaca fusciorufa (new for Austria; fig. 3B) – 5 (sx) JM, OP, JV, ZP
Caloplaca hungarica – 2 (Jsab) JV
Caloplaca livida – 3 (bryo-s) JV
Caloplaca paulii – 3 (sx) JM!
Caloplaca percrocata – 8 (sx) JV
Caloplaca saxifragarum – 3 (pr, pr-cs) JM, OP
Caloplaca schistidii – 3 (sx) ZP
Caloplaca sinapisperma – 3 (cs) JM, 7 (bryo) JV, 8 (bryo-s) JV
Caloplaca stillucidiorum – 2 (dw-Jsab) JV, 3 (bryo, bryo-cs, cs, pr, pr-cs) JM, OP, ZP, 6 (bryo-cs) JM, 8 (bryo-s) JV
Caloplaca subalpina – 2 (sx) ZP, 5 (sx) ZP
Caloplaca tirolensis – 3 (bryo-cs, pr) JM, ZP, 8 (s) JV
Caloplaca velana – 3 (sx) FB
Calvitimela aglaea – 2 (sx) JM, 3 (sx) JV

- Calvitimela armeniaca* – 3 (sx) FB, 8 (sx) JV
Candelariella aggregata (new for Austria) – 3 (pr-cs) JM
Candelariella aurella – 2 (sx) JM, 3 (sx) JM, 8 (sx) JV
Candelariella cf. *oleaginescens* – 5 (sx) ZP
Candelariella vitellina – 2 (sx) JM, 3 (sx) JM, 8 (sx) JV
Candelariella xanthostigma – 2 (dw-Jna, Jsab) JV
Carbonea vitellinaria (Nyl.) Hertel (#) – 3 (lich-sx: on *Candelariella vitellina*) JM, 8 (bryo-s: on *C. vitellina*, lich-sx: on *C. vitellina*, sx) JV
Carbonea vorticosa – 3 (sx) JM, 8 (sx) JV, ZP
Catapyrenium cinereum – 3 (bryo-s, cs, cs-sx) JM, JV, ZP, 8 (s) JV
Catillaria cf. *nigroisidiata* van den Boom (new for Austria) – 3 (sx) JV
Catolechia wahlenbergii – 8 (s) JV
Cephalophysia leucospila – 3 (sx) ZP
Cercidospora solearispora Calat., Nav.-Ros. & Hafellner (#) – 3 (lich-sx: on *Circinaria* cf. *calcarea*) JM
Cetraria ericetorum – 7 (as) ZP, 8 (s) JV
Cetraria islandica – 3 (as) JM, 7 (as) ZP, 8 (s) JV
Cetraria muricata – 8 (s) JV
Cetrariella commixta – 7 (sx)
Circinaria cf. *calcarea* – 3 (sx) JM!
Circinaria contorta – 8 (sx) JV
Cladonia arbuscula – 7 (as) ZP, 8 (s) JV
Cladonia cenotea – 2 (dw)
Cladonia ecmocyna – 7 (as) ZP*
Cladonia gracilis – 8 (s) JV
Cladonia macilenta – 1 (dw) JS
Cladonia macroceras – 3 (s) OP, 7 (as) ZP
Cladonia macrophyllodes – 6 (hum) JS
Cladonia pocillum – 3 (pr-cs) JM
Cladonia pyxidata – 2 (bryo-sx) ZP, 6 (s) ZP*, 8 (bryo-s, s) JV
Cladonia rangiformis – 8 (s) JV
Cladonia strepsilis – 7 (as) ZP
Cladonia uncialis – 8 (s) JV
Clauzadea monticola – 3 (sx) JM, 8 (sx) ZP
Cornicularia normoerica – 2 (sx) JM, OP, 5 (sx) JS, 7 (sx) ZP, 8 (sx) JV
Cystocoleus ebeneus – 2 (sx) ZP
Dacampia hookeri – 3 (s-sx) ZP
Dacampia peltigericola D.Hawksw. & C.J.B.Hitch (#) – 8 (lich-s: on *Peltigera venosa*) JV
Dactylina ramulosa – 3 (as, s) JM, OP, 8 (bryo-s) JV
Dactylospora urceolata (Th.Fr.) Arnold (#) – 8 (lich-s: on *Gyalecta foveolaris*) JV
Dimelaena oreina – 2 (sx) JM, ZP, 3 (sx) JM, ZP
Diploschistes gypsaceus – 3 (sx)
Diploschistes muscorum – 3 (bryo) OP, 7 (pr, bryo-sx) ZP, 8 (s) JV

- Diploschistes scruposus* – 6 (sx) FB, 7 (sx) JV, 8 (sx) JV
Eiglera flavida – 3 (sx) ZP, 8 (sx) JV
Elixia flexella – 2 (dw-Lar) FB, JV
Enchylium polycarpon – 3 (sx) JM, JS
Enchylium tenax – 8 (s) JV
Enterographa zonata – 5 (sx) ZP
Epilichen scabrosus – 8 (lich-s: on *Baeomyces rufus*) JV
Evernia mesomorpha – 2 (Lar)
Farnoldia jurana subsp. *jurana* – 5 (sx) JV, 8 (sx) JV
Farnoldia micropsis – 5 (sx) JM, JV, 8 (sx) JV
Flavocetraria cucullata – 3 (as) FB, JM, 8 (s) JV
Flavocetraria nivalis – 8 (s) JV
Fulgensia fulgens – 8 (s) JV
Fuscidea kochiana – 8 (sx) JV
Fuscopannaria aff. *praetermissa* (Fig. 3C) – 2 (s) JV! (morphologically different from *F. praetermissa*, genetically very close)
Fuscopannaria praetermissa – 2 (bryo-sx) ZP, 4 (pr-cs) JM, 8 (hum-sx, bryo-s, s) ZP, JV
Gyalecta aff. *jenensis* – 8 (sx) ZP
Gyalecta erythrozona – 8 (sx) JV
Gyalecta foveolaris – 3 (bryo, cs, s) JM, OP, 7 (bryo-s) JV, 8 (hum-xs, bryo-s, sx) ZP, JV
Gyalidea asteriscus (Fig. 2B) – 3 (s) FB
Gyalideopsis helvetica – 2 (dw-Lar) ZP
Gyalolechia bracteata – 3 (cs, cs-sx, s, s-sx, sx) JM, OP, ZP, 8 (s-sx) JV
Gyrographa gyrocarpa – 2 (sx) ZP
Halecania spodomela (new for Austria; fig. 3D) – 8 (sx) JV
Henrica theleodes – 8 (sx) JV
Heppia adglutinata – 3 (s) OP
Heppia lutosa – 3 (cs) JM
Hymenelia epulotica – 3 (sx) JM
Hypogymnia austerodes – 2 (Lar) JV, OP, ZP, 3 (sx) JS
Hypogymnia bitteri – 2 (Lar) JS, ZP, 8 (s) JV
Hypogymnia farinacea – 2 (Lar) JM
Hypogymnia physodes – 8 (s) JV
Hypogymnia vittata – 8 (bryo-s, s) JV
Icmadophila ericetorum – 2 (dw-Lar) ZP
Immersaria athrocarpa – 2 (sx) JM
Ingvariella bispora – 5 (sx) JM
Involucropyrenium waltheri – 3 (s) JV
Lambiella insularis – 3 (sx: *Lecanora rupicola*) JS
Lathagrium auriforme – 3 (bryo-sx)
Lathagrium fuscovirens – 3 (sx) ZP
Lathagrium undulatum – 3 (sx)

- Lecanora albula* – 3 (sx) FB, JM, OP, 5 (sx) JV, 8 (lich-sx: *Caloplaca* sp.) JV
Lecanora cf. *albula* – 2 (sx) ZP*
Lecanora cf. *anopta* – 2 (dw-Lar) ZP
Lecanora argopholis – 2 (sx) ZP, 5 (sx) JV
Lecanora bicincta – 3 (sx) JM, OP
Lecanora cf. *bicincta* – 3 (sx) ZP
Lecanora cadubriae – 2 (dw-Lar, Lar) FB, JM, JV, OP*, ZP
Lecanora cenisia – 8 (sx) JV
Lecanora dispersoareolata – 3 (sx) JM!, ZP, 8 (sx) ZP
Lecanora epanora – 2 (sx) ZP*
Lecanora epibryon – 3 (bryo-cs, bryo-sx) JM, JV, OP, ZP, 8 (bryo-s) JV
Lecanora epibryon var. *bryopsora* – 3 (bryo-cs, pr, s) JM, OP, 6 (pr, bryo-cs) JM
Lecanora exspersa – 2 (dw-Lar) ZP*
Lecanora frustulosa – 8 (sx) ZP
Lecanora hypoptoides – 2 (dw-Lar) JV
Lecanora intricata – 8 (sx) JV
Lecanora lecanoricola (Alstrup, D.Hawksw. & R.Sant.) Rambold & Triebel (#) – 5 (lich-sx: on *Lecanora cenisia*) ZP
Lecanora lojkaeana – 2 (sx) JM!, ZP
Lecanora cf. *lojkaeana* – 2 (sx) ZP*
Lecanora margucea – 2 (sx) ZP*
Lecanora marginata (Fig. 2C) – 2 (sx) ZP*, 3 (sx) FB, JM, OP, ZP*, 8 (sx) JV
Lecanora mughicola – 2 (dw-Lar) FB
Lecanora phaeostigma – 2 (Lar) JM
Lecanora polytropa – 2 (sx) JM, 5 (sx) JM, 8 (sx) JV
Lecanora pulicaris – 2 (Lar) ZP
Lecanora reagens – 2 (sx) FB, ZP
Lecanora rupicola – 2 (sx) JM, 3 (sx) JM
Lecanora aff. *rupicola* – 2 (sx) ZP*
Lecanora rupicola agg. – 3 (sx) ZP
Lecanora rupicola subsp. *subplanata* – 8 (sx) JV
Lecanora stenotropa – 3 (sx) JM
Lecanora subintricata – 2 (Lar) ZP
Lecanora swartzii – 2 (sx) ZP
Lecanora varia – 2 (dw-Lar, Lar) JM, ZP
Lecidea atrobrunnea – 3 (sx) JM, OP, 8 (sx) JV
Lecidea atrobrunnea subsp. *porphyrilica* – 8 (sx) JV
Lecidea auriculata – 3 (sx) ZP, 8 (sx) JV, ZP
Lecidea berengeriana – 3 (pr, s) FB, JS, 7 (bryo-s) JV, 8 (hum-sx, bryo-s, s) ZP, JV
Lecidea confluens – 8 (sx) ZP
Lecidea haerjedalica – 3 (sx) ZP
Lecidea lactea – 8 (sx) JV

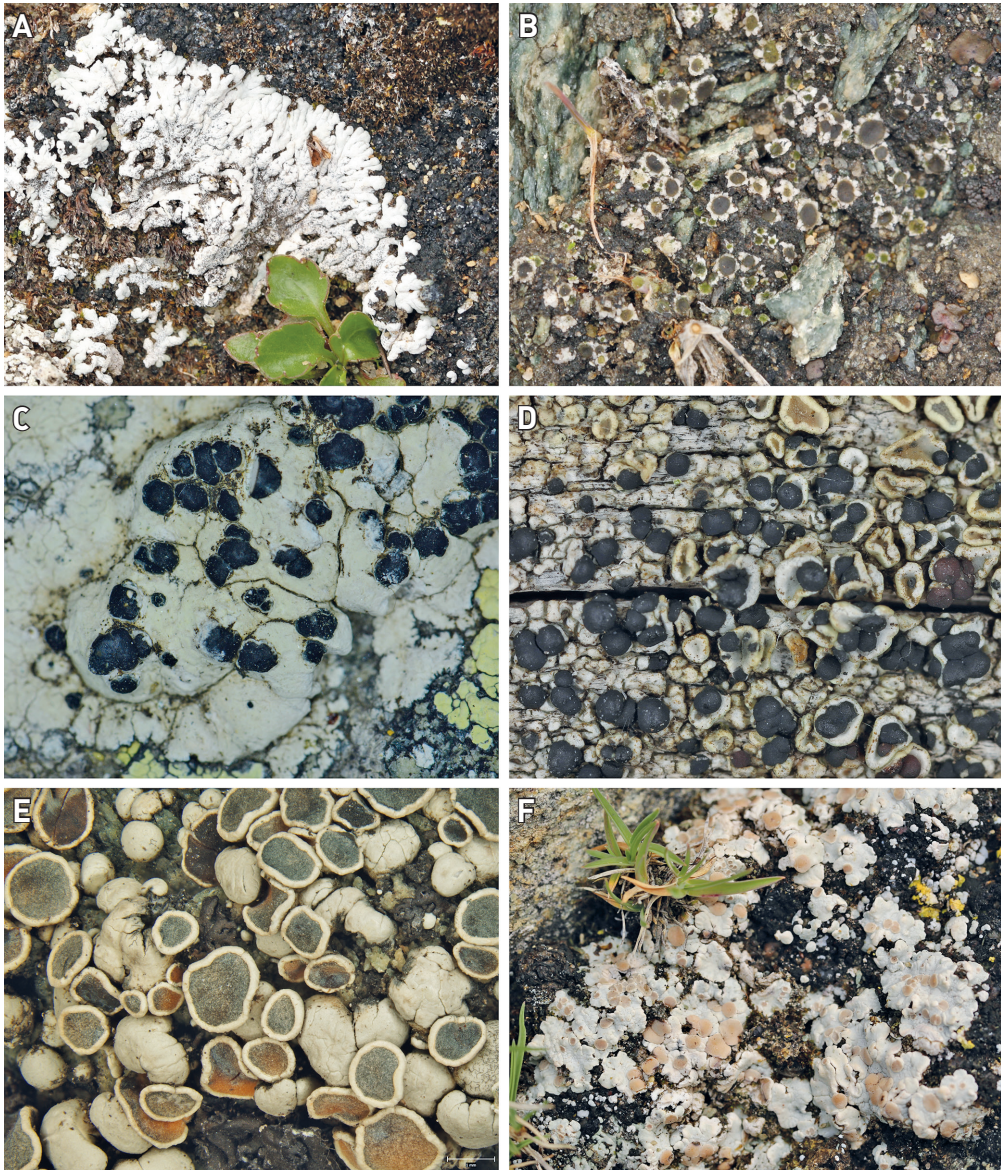


Fig. 2. Interesting lichens recorded during our research. **A** – *Buellia elegans*. **B** – *Gyalidea asteriscus*. **C** – *Lecanora marginata* JM 15348. **D** – *Ramboldia insidiosa*. **E** – *Rhizoplaca* cf. *subdiscrepans*, the atypical sequenced specimen, JM 16629. **F** – *Squamarina nivalis*. Photo by F. Bouda (A, B, D, F), J. Malíček (C) & J. Machač (E).

Lecidea lapicida – 8 (sx) JV

Lecidea lapicida var. *lapicida* – 3 (sx) JM

Lecidea leucothallina – 7 (sx) ZP, 8 (sx) ZP

Lecidea paupercula – 8 (sx) JV

Lecidea promiscens – 8 (sx) JV

- Lecidea promiscua* – 8 (sx) JV
Lecidea silacea – 7 (sx)
Lecidea sudetica – 8 (sx) JV
Lecidea swartzioidea – 8 (sx) JV
Lecidea turgidula – 2 (Lar) JM
Lecidea umbonata – 3 (sx) JM, JV
Lecidella carpathica – 2 (sx) JV, 3 (sx) JM
Lecidella effugiens – 2 (sx) JM
Lecidella elaeochroma – 2 (Cal) JV
Lecidella patavina – 3 (sx) JM, ZP, 8 (sx) JV
Lecidella stigmatea – 2 (sx) JM!, 3 (sx) JM, 8 (sx) ZP, JV
Lecidella wulfenii – 3 (bryo-s) JV, 6 (bryo-cs) JM, 7 (bryo) JV, 8 (bryo-s, epi, pr, s) JV, OP, ZP
Lecidoma demissum – 5 (as) OP, 7 (as) ZP, 8 (s) JV
Lempholemma cladodes (new for Austria) – 2 (sx) ZP
Lempholemma isidioides (new for Austria; fig. 3E) – 3 (sx) ZP
Lepraria alpina – 5 (bryo-sx) OP*
Lepraria borealis – 5 (bryo-sx) JM*
Lepraria caesioalba – 5 (bryo-sx) OP*, 7 (sx) ZP*
Lepraria diffusa – 2 (bryo-sx) OP*
Lepraria eburnea – 3 (bryo-s) OP*
Lepraria incana – 2 (bryo-sx) ZP
Lepraria neglecta – 2 (bryo-sx) OP*
Lepraria rigidula – 2 (bryo-sx, sx) JM, ZP*
Leproplaca obliterans – 2 (sx) JM, ZP
Leptogium saturninum – 2 (bryo-sx) FB
Letharia vulpina – 2 (Lar)
Lobaria linita – 8 (s) JV
Megaspora verrucosa – 3 (bryo, bryo-cs, pr, pr-cs, s) FB, JM, JS, OP, 8 (bryo-s, s) JV
Melanelia hepatizon – 2 (sx), 8 (sx) JV
Melanelia stygia – 3 (sx) OP, 8 (sx) JV
Melanohalea elegantula s.l. – 3 (sx) JM!
Micarea fennica Launis & Myllys (new for Austria) – 2 (dw-Lar) ZP*
Micarea leprosula – 7 (pr) ZP*
Microcalicium disseminatum (#) – 2 (Lar) ZP
Microcalicium loraasii Holien & Frisch (new for Austria; #) – 2 (Lar) JM!, JV
Miriquidica aff. *instrata* – 3 (sx) ZP*
Miriquidica garovaglii – 2 (sx) ZP, 5 (sx) JM
Miriquidica cf. *garovaglii* – 3 (sx) JM
Miriquidica invadens – 8 (sx) JV
Miriquidica leucophaea – 7 (sx) ZP
Miriquidica subplumbea – 8 (sx) JV
Montanelia disjuncta – 2 (sx)

- Montanelia panniformis* – 2 (sx) JS
- Muellerella pygmaea* (Körb.) D.Hawksw. (#) – 8 (lich-sx: on *Farnoldia micropsis*) JV
- Muellerella pygmaea* var. *athallina* (Müll.Arg.) Triebel (#) – 2 (lich-sx) JV
- Muellerella pygmaea* var. *pygmaea* (Körb.) D.Hawksw. (#) – 5 (lich-sx: on *Caloplaca castellana*) JV
- Multiclavula corynoides* – 3 (s) FB
- Myriolecis dispersa* agg. – 3 (sx) JM
- Myriolecis invadens* – 3 (sx) JM
- Myriolecis semipallida* – 3 (sx) JM, 8 (sx) JV
- Myriolecis zosteræ* var. *palanderi* – 3 (pr-cs) JM, 8 (bryo-s) JV
- Nephroma bellum* – 2 (bryo-sx) ZP
- Nephroma parile* – 2 (bryo-sx)
- Nephroma resupinatum* – 2 (bryo-sx) FB, OP
- Nephromopsis laureri* – 2 (bryo, Lar) JS, FB
- Normandina acroglypta* agg. – 2 (lich-sx: on *Parmeliella triptophylla*) JV, 3 (hum-sx) ZP
- Ochrolechia alboflavescens* – 2 (dw-Jsab, Lar) FB, JV, OP*
- Ochrolechia frigida* – 3 (pr) OP, 7 (pr) ZP, 8 (bryo-s) JV
- Ochrolechia inaequatula* – 8 (bryo-s, s) JV
- Ochrolechia tartarea* – 8 (s) JV
- Ochrolechia upsaliensis* – 3 (bryo, bryo-s) FB, OP*, JV, 6 (pr, bryo-cs) JM
- Ophioparma ventosa* – 2 (sx) ZP, 8 (sx) JV
- Orphniospora moriopsis* – 3 (sx) FB
- Pannaria conoplea* – 2 (bryo-sx)
- Pannaria hookeri* – 8 (s) JV
- Parmelia omphalodes* agg. – 2 (sx), 8 (s) JV
- Parmelia saxatilis* – 2 (bryo-sx) JM, 8 (s) JV
- Parmelia sulcata* – 2 (Lar) JM
- Parmeliella triptophylla* – 2 (bryo-sx, sx) JM, JS
- Parmelina tiliacea* – 2 (sx) OP
- Parmeliopsis ambigua* – 2 (Lar) JM
- Parmeliopsis hyperopta* – 2 (Lar) JM
- Peltigera aphthosa* – 2 (bryo) JS, 8 (s) JV
- Peltigera canina* – 2 (bryo) JS, 8 (bryo-s) JV
- Peltigera elisabethae* – 2 (bryo-sx) JM
- Peltigera leucophlebia* – 2 (bryo-sx) ZP, 3 (bryo-sx), 8 (s) JV
- Peltigera neckeri* – 2 (bryo) JS
- Peltigera rufescens* – 2 (hum-sx) JM, 8 (s) JV
- Peltigera venosa* – 8 (s) JV
- Pertusaria amarescens* – 3 (sx) JM, ZP
- Pertusaria corallina* – 8 (sx) JV
- Pertusaria glomerata* – 8 (bryo-s) JV
- Pertusaria pertusa* – 2 (sx) FB
- Pertusaria pseudocorallina* – 3 (sx) FB



Fig. 3. Interesting lichens recorded during our research II. **A** – *Caloplaca approximata* JV 28047. **B** – *Caloplaca fuscorufa* JV 27890. **C** – *Fuscopannaria* aff. *praetermissa* JV 27772. **D** – *Halecania spodomela* JV 27818. **E** – *Lempholemma isidiodes* ZP 35008. **F** – *Placynthium pulvinatum* JV 27769. **G** – *Protoparmeliopsis bolcana*. **H** – *Thelignya lignyota* JV 27897. Photo by F. Bouda (G) & J. Macháč (others).

- Phaeophyscia sciastra* – 2 (sx) ZP
Phaeorrhiza nimbose – 3 (cs, cs-sx, hum-sx, s, s-sx) JM, JV, ZP, 8 (bryo-s) JV
Phaeorrhiza sareptana – 8 (s) JV
Phaeospora catolechia Zopf (#) – 8 (lich-s: on *Catolechia wahlenbergii*) JV
Physcia caesia – 3 (sx) JM
Physcia phaea – 8 (sx) JV
Physconia muscigena – 2 (bryo-sx) JM, 3 (bryo, bryo-cs, s) FB, JM, OP, 8 (s) JV
Placidopsis tirolensis – 8 (s) JV
Placidium squamulosum – 3 (cs) JM
Placynthium asperellum – 2 (sx) JM!
Placynthium dolichoterum – 8 (sx) JV
Placynthium nigrum – 3 (sx) ZP
Placynthium pannariellum – 5 (sx) JV
Placynthium pulvinatum Øvstedal (new for Austria; fig. 3F) – 8 (s) JV
Pleopsidium flavum – 8 (sx) JV
Polyblastia clandestina – 8 (sx) JV
Polyblastia cupularis – 3 (sx) JM, ZP, 8 (sx) JV
Polyblastia fuscoargillacea – 3 (sx) JM
Polyblastia helvetica – 8 (bryo-s) JV
Polyblastia microcarpa – 8 (sx) JV
Polyblastia peminosa – 3 (sx) JV
Polyblastia rivalis – 8 (sx) JV
Polyblastia sendtneri – 3 (cs, pr, s) ZP, JV, 8 (bryo-s, pr, s) JV, ZP
Polyblastia cf. *verrucosa* – 3 (sx) JM
Polychidium muscicola – 2 (bryo-sx) ZP
Porina alpina – 8 (bryo-s) JV
Porina chlorotica – 2 (sx) ZP, 5 (sx) ZP
Porina rosei (new for Austria) – 2 (sx) ZP
Porpidia macrocarpa – 3 (sx) JM
Porpidia nigrocruenta – 8 (sx) JV
Porpidia speirea – 8 (sx) ZP*
Porpidia trullisata – 7 (sx) JV, 8 (sx) JV
Porpidia zeoroides – 3 (sx) JM, 8 (sx) JV
Protoblastenia laeta – 3 (sx) JM
Protoblastenia siebenhaariana – 8 (sx) JV
Protoblastenia terricola – 3 (sx) JM, 8 (s) JV
Protomicarea limosa – 8 (bryo-s) JV
Protopannaria pezizoides – 8 (hum-sx, s) ZP, JV
Protoparmelia badia – 3 (sx) OP, ZP, 5 (sx) JM, ZP, 7 (sx) ZP, 8 (sx) ZP, JV
Protoparmelia badia var. *cinereobadia* – 7 (sx) ZP, 8 (sx) JV
Protoparmelia leproloma (new for Austria) – 2 (sx) ZP
Protoparmelia memnonia – 2 (sx) JM, OP, 3 (sx) FB

- Protoparmeliopsis bolcana* (new for Austria; fig. 3G) – 5 (sx) JM
Protothelenella sphinctrinoides – 8 (bryo-sx) ZP
Pseudephebe minuscula – 3 (sx) FB, 7 (sx)
Pseudephebe pubescens – 5 (sx), 8 (sx) JV
Pseudevernia furfuracea – 2 (Lar) JM, 8 (s) JV
Psora decipiens – 3 (cs, cs-sx) JM, ZP, 8 (s) JV
Psora globifera – 2 (cs) OP
Psora rubiformis – 8 (cs-sx, s) JV, ZP
Psorinia conglomerata – 2 (sx) JM, 3 (sx) FB
Psoroglaena stigonemoides – 8 (bryo-s: on *Phaeorrhiza nimbose*) JV
Psoroma tenue – 5 (s) JV
Pycnothelia papillaria – 7 (as) ZP
Pyrenodesmia helygeoides – 2 (sx) ZP, 3 (sx) JM, ZP, 5 (sx) JV
Pyrenodesmia variabilis – 3 (sx) ZP
Ramalina capitata – 2 (sx)
Ramboldia insidiosa (Fig. 2D) – 2 (dw-Lar) FB, JV, OP, ZP
Rhizocarpon atroflavescens – 2 (sx) JM, 3 (sx) FB, JM, ZP
Rhizocarpon disporum – 2 (sx) JV
Rhizocarpon effiguratum – 3 (sx) FB
Rhizocarpon geminatum – 2 (sx) FB, JM, JV, ZP, 5 (sx) JM, JV
Rhizocarpon geographicum – 2 (sx) FB, JM, 3 (sx) JM, 5 (sx) JM, JV, 7 (sx) ZP, 8 (sx) JV
Rhizocarpon geographicum subsp. *kittilense* – 8 (sx) JV
Rhizocarpon lavatum – 8 (sx) JV
Rhizocarpon norvegicum – 3 (sx) FB
Rhizocarpon polycarpum – 2 (sx) ZP
Rhizocarpon umbilicatum – 3 (sx) ZP
Rhizoplaca chrysoleuca – 2 (sx) JM, OP, 3 (sx), 8 (sx) JV
Rhizoplaca melanophthalma – 5 (sx), 8 (sx) JV
Rhizoplaca subdiscrepans – 2 (sx) JM, 3 (sx) FB, JS, 8 (sx) JV
Rhizoplaca cf. *subdiscrepans* (Fig. 2E) – 5 (sx) JM!
Rinodina cf. *calcigena* (Th.Fr.) Lyng (new for Austria) – 3 (sx) JV (rev. H. Mayrhofer)
Rinodina cinnamomea – 7 (bryo-s) JV, 8 (bryo-s, s) JV, OP*
Rinodina conradii – 2 (dw) JV
Rinodina milvina – 3 (sx) FB, 5 (sx) JM (rev. H. Mayrhofer), JV, OP, ZP
Rinodina mniaroea – 2 (bryo-sx) ZP, 8 (bryo-s) JV
Rinodina mniaroeiza – 8 (s) JV
Rinodina olivaceobrunnea – 8 (bryo-s) JV
Rinodina roscida – 3 (bryo, pr, pr-cs) JM, OP, 8 (bryo-s) JV
Rinodina septentrionalis – 2 (dw-Jsab) JV
Rinodina trevisanii – 2 (dw-Jna) JV
Romjularia lurida – 2 (s, sx)
Scoliciosporum umbrinum – 3 (sx) JM, ZP

- Scytinium biatorinum* – 3 (sx) JV, ZP, 8 (sx) JV
Scytinium imbricatum – 3 (bryo)
Scytinium intermedium – 8 (bryo-s, s) JV
Scytinium pulvinatum – 8 (bryo-s) JV
Scytinium sp. – 8 (sx) JV! (very tiny species)
Scytinium subtile – 8 (bryo-s) JV
Schadonia fecunda – 8 (bryo-s) JV
Schaereria fuscocinerea – 2 (sx) JM, 5 (sx) ZP, 8 (sx) JV
Solorina bispora – 3 (cs, hum, s) JM, JS, OP, 8 (hum-sx, s) ZP, JV
Solorina crocea – 8 (s) JV
Solorina octospora – 8 (cs-sx, bryo-s, s) ZP, JV
Solorina saccata – 3 (s) OP
Solorina spongiosa – 3 (s)
Sporastatia polyspora – 8 (sx) JV
Sporastatia testudinea – 3 (sx) FB, OP, ZP, 8 (sx) JV
Sporodictyon schaeerianum – 3 (sx) ZP
Squamarina nivalis (Fig. 2F) – 3 (cs, s-sx) FB, JM, OP, ZP
Staurothele areolata – 3 (sx) JM, 8 (sx) JV
Staurothele frustulenta – 3 (sx) ZP, 5 (sx) ZP
Staurothele succedens – 3 (sx) ZP
Stenhammarella turgida – 3 (sx) JM, 8 (sx) ZP
Stereocaulon alpinum – 7 (as) ZP, 8 (s) JV, OP
Stereocaulon capitellatum (new for Austria) – 3 (bryo-sx) JM!
Stereocaulon glareosum – 5 (s) JV
Stereocaulon nanodes – 8 (sx) JV
Stigmatidium cerinae Cl.Roux & Triebel (#) – 3 (lich-pr-cs: on *Myriolecis zosteriae*) JM (det. F. Berger)
Strangospora moriformis – 2 (dw-Lar) JV
Synalissa ramulosa – 2 (sx) JV, 3 (sx) JV
Tephromela atra – 2 (sx), 3 (sx), 8 (sx) JV
Tetramelas chloroleucus – 2 (dw-Jna) JV
Tetramelas insignis – 3 (pr-cs) JM, 8 (bryo-s) JV
Tetramelas pulverulentus – 3 (cs-sx) OP, ZP
Thalloidima diffractum – 3 (cs, cs-sx, s-sx) JM, ZP
Thalloidima opuntioides – 3 (s-sx) ZP
Thalloidima rosulatum – 3 (s-sx) ZP, 8 (bryo-s) JV
Thamnolia vermicularis agg. – 3 (bryo-cs) JM, 8 (s) JV
Thelenella muscorum – 2 (bryo-sx) ZP
Thelidium auruntii – 8 (bryo-s) JV
Thelidium incavatum – 8 (sx) JV
Thelidium papulare – 3 (sx) ZP
Thelidium pyrenophorum – 3 (sx) JM, 8 (sx) JV
Thelidium ungeri – 7 (sx) JV, 8 (sx) JV

- Thelignya lignyota* (Fig. 3H) – 5 (sx) JV
Thelocarpon impressellum – 3 (bryo-s) OP
Thelopsis melathelia – 8 (cs-sx, s) ZP, JV
Thermutis velutina – 2 (sx) JV
Toninia aromatica – 3 (s) OP, 8 (s) JV
Toninia cf. *aromatica* – 3 (s) OP
Toninia fusispora – 8 (s) JV
Toninia squalida – 2 (sx) ZP
Toniniopsis bagliettoana – 3 (pr, s-sx) JM, JS, ZP, 8 (bryo-s, s) JV
Toniniopsis cf. *verrucarioides* – 3 (sx) ZP
Trapelia glebulosa – 7 (sx) JS
Tremolecia atrata – 8 (sx) JV
Umbilicaria cinereorufescens – 2 (sx) JM!
Umbilicaria cylindrica – 5 (sx) JM, 6 (sx) JS, 7 (sx) ZP, 8 (sx) JV
Umbilicaria decussata – 3 (sx) FB
Umbilicaria microphylla – 7 (sx) ZP
Umbilicaria ruebeliana – 2 (sx) JM!
Umbilicaria subglabra – 6 (sx) FB
Umbilicaria vellea – 2 (sx) FB, 5 (sx) JS
Varicellaria lactea – 3 (sx) FB, JM
Varicellaria rhodocarpa – 3 (s) FB, 6 (pr) JS, 7 (pr) ZP, 8 (pr-s) JV
Verrucaria alpigena – 8 (sx) JV
Verrucaria finitima – 3 (sx) JM, 8 (sx) JV
Verrucaria fischeri – 3 (sx) ZP, 8 (sx) JV
Verrucaria hochstetteri – 8 (sx) JV
Veizdaea rheocarpa – 8 (bryo-s) JV
Vulpicida juniperinus – 3 (pr) ZP
Vulpicida pinastri – 2 (Lar) JM
Vulpicida tubulosus – 3 (hum, pr) JS, OP, 8 (s) JV
Xanthoparmelia verruculifera – 2 (sx) JM
Xanthoria elegans – 2 (sx) JM, 3 (sx) FB, JM, 5 (sx) JM, 8 (sx) JV
Xanthoria sorediata – 2 (sx) ZP, 3 (sx), 8 (sx) JV
Xylographa soralifera – 2 (dw-Lar) JV
Zahlbrucknerella calcarea – 3 (sx) ZP

Comments on species new to Austria

Caloplaca approximata

Arctic to boreal species, in the Alps so far known only from a single locality in Switzerland (NIMIS et al. 2018). We collected the species on mica schist rocks, in one case distinctly enriched by calcium, at the Eisse lake.

Caloplaca fuscorufa

This is a poorly known species similar to *C. crenularia* and *C. exsecuta*. For a long time it was known only from a single locality in Sweden. *C. fuscorufa* grows on various kinds of rocks, often on slightly calciferous types, and prefers habitats near water, mainly by streams or brooks or from seepage surfaces (ARUP et al. 2007). It is widespread in Northern Europe; from the Alps there was so far a single record from Switzerland, which needs re-confirmation (NIMIS et al. 2018). We found a single population on a wind-exposed (inclined to vertical surfaces) mineral-rich prasinite rock along the path between Sajathütte and Eisseehütte.

Candelariella aggregata

Species growing on plant debris and cushions of bryophytes. So far there are only a few records from the Alps, but perhaps the species was not distinguished from *C. aurella* in the past (NIMIS et al. 2018). Our specimen was collected on plant debris on calcareous soil on Mt Rote Säule (alt. 2760 m).

Catillaria* cf. *nigroisidiata

An inconspicuous and very poorly known saxicolous species new to the Alps. It has been described and so far reported only from the Netherlands, where it occurs on anthropogenic substrates (VAN DEN BOOM 2002). We collected a single poor specimen on a calcareous rock in the alpine meadows below Sajathütte (alt. 2350 m).

Halecania spodomela

Inconspicuous lichen associated with cyanobacteria (CANNON et al. 2022) or *Placynthium* species (NIMIS et al. 2018). In Western Europe it occurs on slightly base-enriched siliceous rocks, usually near the coast (CANNON et al. 2022). In the Alps it is known from a single locality in Italy (NIMIS et al. 2018). We collected this species on cyanobacteria on calcareous micaschist stones in the bedrock of the Timmelbach brook flowing out of the Eisse lake.

Lempholemma cladodes

Cyanolichen with characteristic hormocystangia in the swollen apices of the branches (JØRGENSEN 2007). It grows on calcareous rocks in cool situations and is widespread in Scandinavia, but not common. In the Alps, *L. cladodes* has only been recorded in Switzerland (NIMIS et al. 2018). We collected this cyanolichen only once on the seepage of the SE-facing vertical side of a big ‘erratic’ boulder (prasinite) between Hinterbichl and Sajathütte.

Lempholemma isidioides

The species is similar to *L. botryosum*, but differs in more rosette-like thallus and cylindrical lobes resembling isidia (JØRGENSEN 2007). It grows on irrigated faces of various types of rocks. The species is widespread in Northern Europe and known from scattered localities throughout the Alps (NIMIS et al. 2018). Our single collection is from the seepage on foot of a steep-facing calcareous schist rock close to Sajathütte.

Micarea fennica

A minute pycnidiate species, similar to *M. hedlundii*, growing on wood. It has recently been described from Finland (LAUNIS & MYLLYS 2019) and later reported from Norway (KLEPSLAND 2020) and Russia (KONOREVA et al. 2021). Here it is reported for the first time from the Alps. We collected it on decaying wood of stump in larch forest above Hinterbichl (alt. 1788 m).

Microcalicium loraasii

An inconspicuous calicioid fungus, growing on wood and bark of conifers. It was recently independently described from Norway and the Czech Republic (HOLIEN & FRISCH 2022, VONDRÁK et al. 2022 as *M. minutum* Vondrák & Svoboda). Here the species is reported as new to the Alps. We collected it on bark of *Larix decidua* in forests above Hinterbichl (alt. 1790 m). The specimens are very similar to *M. disseminatum* in the absence of whitish pruina and ascospores up to 3-septa. Nevertheless, the ascomata are very small comparing to typical *M. disseminatum* and our identification was confirmed by mitochondrial SSU.

Placynthium pulvinatum

The cushion-forming arctic-alpine cyanolichen grows on moist calcareous soil. It has been known only from northern Euroasia (WESTBERG et al. 2016). Species new to the Alps. We recorded this species on soil at Eisseelake.

Porina rosei

Partly misunderstood, often sterile taxon of *Porina* with a finely isidiate coralloid thallus, previously often mistaken for the recently described *Coenogonium nimisii* (MALÍČEK et al. 2023). The species was formerly known mainly as an epiphyte from the European oceanic regions (including the Western Alps; NIMIS et al. 2018), but in inland areas it can also occur on shady overhanging siliceous rocks in humid localities. Even when sterile it can be distinguished from the superficially similar, apparently more oceanic *Coenogonium nimisii* by its finer habitus, distinctly corticate thalline filaments and by a slow K⁺ purplish reaction in microscopic slides (see MALÍČEK et al. 2023).

Protoparmelia leproloma

An arctic-alpine silicicolous species which starts its life cycle on other crustose lichens, mainly *Lecidea paupercula*. The voucher specimen is, however, an autonomous, well developed lichen, not closely associated with any supposed host lichen. In the Alps it is so far known only from Italy above the treeline (NIMIS et al. 2018). Our single collection comes from a wind-exposed prasinite rock on a crest between Hinterbichl and Sajathütte.

***Protoparmeliopsis bolcana* (Fig. 3)**

Saxicolous species similar to *P. muralis*, but forming thinner thallus with black-rimmed areoles and apothecia. Its ecological optimum is in the Mediterranean, but it is also distributed in the Western and Southern Alps (NIMIS et al. 2018). The single voucher was collected on a prasinite rock along path between Sajathütte and Eisseehütte (alt. 2315 m).

Rinodina* cf. *calcigena

Arctic-alpine species very similar to *R. bischoffii*, growing on calcareous rocks, reported here for the first time from the Alps. In Europe, it was known only from northern part of the continent (MAYRHOFER & MOBERG 2002). Our single record comes from a calcareous rock on pastures between Hinterbichl and Sajathütte. However, the specimen is small and pycnidia with typical conidia were not found. We therefore report this species with some uncertainty.

Stereocaulon capitellatum

A rare arctic-alpine sorediate species growing on stones and acidic soil. In the Alps it has only been recorded in Switzerland (NIMIS et al. 2018). We collected it on a mossy siliceous rock on the S-facing rock slopes of Mt. Rote Säule. Based on ITS, so far missing from this species in the GenBank database, *S. capitellatum* is related to *S. rivulorum* and *S. alpinum*.

Conclusions

The locality harbours exceptionally rich lichen communities, including a high number of rare species. Typical high-mountain elements are mixed here with continental or even xerothermic species, such as *Buellia elegans*, *Fulgensia fulgens*, *Gyalidea asteriscus*, *Heppia lutosana*, *Ingvariella bispora*, and *Protoparmeliopsis bolcana*. Species newly recorded for Austria in most cases belong to taxonomically difficult and poorly known groups, such as cyanolichens, or inconspicuous microlichens and lichen-allied fungi, such as genera *Micarea* and *Microcalicium*. Nevertheless, some of them are quite distinct (e.g. *Protoparmeliopsis bolcana*) and had to be overlooked in the country. Noteworthy lichens were distributed all over the explored area. A very specific lichen biota with several new species to Austria was recorded on calcareous mica schist rocks in the surroundings of the Eisseelake, located in the national park. This site was also the most species-rich locality with 204 recorded species.

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