Lichens and allied non-lichenized fungi of virgin forests in the Caucasus State Nature Biosphere Reserve (Western Caucasus, Russia)

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Abstract: Urbanavichus, G., Vondrák, J., Urbanavichene, I., Palice, Z. & Malíček, J. 2020. Lichens and allied non-lichenized fungi of virgin forests in the Caucasus State Nature Biosphere Reserve (Western Caucasus, Russia). – Herzogia **33**: 90–138.

We report on 659 epiphytic and epixylic species recorded from seven one-hectare plots established along an altitudinal gradient in a virgin forest of the Caucasus State Nature Biosphere Reserve. A total of 564 species are lichens, 61 are lichenicolous fungi and 34 are allied non- or facultatively lichenized fungi. one hundred forty – nine species (116 lichens, 17 lichenicolous and 16 saprophytic fungi) are new to the Northern Caucasus, including 133 species (104 lichens, 15 lichenicolous and 14 saprophytic fungi) that are new to the Caucasus Mountains. Fifty species are reported from Russia for the first time: 37 lichens (*Andreiomyces obtusaticus*, *Bacidina mendax*, *Biatora aegrefaciens*, *B. bacidioides*, *B. chrysanthoides*, *Biatorella dryophila*, *Buellia iberica*, *Cliostomum haematommatis*, *Endohyalina ericina*, *Fellhanera christiansenii*, *Gyalidea minuta*, *Japewia aliphatica*, *Lecanora barkmaniana*, *L. subravida*, *Lecidea strasseri*, *Leptogium hibernicum*, *Lithothelium hyalosporum*, *L. phaeosporum*, *L. septemseptatum*, *Loxospora cristinae*, *Melanelixia epilosa*, *Micarea nowakii*, *M. perparvula*, *Opegrapha trochodes*, *Orcularia insperata*, *Parvoplaca servitiana*, *Phylloblastia inexpectata*, *Psoroglaena stigonemoides*, *Ptychographa xylographoides*, *Ramonia dictyospora*, *R. luteola*, *Rinodina polysporoides*, *Thelopsis flaveola*, *Topelia jasonhurii*, *Verrucaria hegetschweileri*, *Wadeana minuta*, *Waynea giraltiae*), nine lichenicolous fungi (*Arthonia vorsoeensis*, *Didymocyrtis melanelixiae*, *Epigloea urosperma*, *Muellerella polyspora*, *Phacographa zwackhii*, *Pronectria pilosa*, *Rhymbocarpus pubescens*, *Taeniolella friesii*, *Unguiculariopsis acrocordiae*) and four non-lichenized saprophytic fungi (*Cyrtidula major*, *Karschia cezannei*, *Kirschsteiniothelia recessa*, *Pseudotryblidium neesii*).

The ratio of macrolichens ranges between 26.5–40% and rises with elevation. Lichens with a trentepohlioid photobiont are represented by 15–51 species per plot and their species richness decreases with elevation. The species richness of cyanolichens is substantial in all plots (15–28 species) reflecting a negligible effect of acidification/air pollution. Low species richness and low abundances of nitrophilous species indicate insignificant uptake of nitrogen emissions. Beech and fir are the most preferred phorophytes, but the vast majority of lichen species have low substrate specificity. Species richness per plots ranged between 236 and 379. The highest richness was found in a plot outside the Caucasian Reserve and we recommend its inclusion into the protected area.

Zusammenfassung: Urbanavichus, G., Vondrák, J., Urbanavichene, I., Palice, Z. & Malíček, J. 2020. Flechten und flechtenähnliche Pilze in Urwäldern des Kaukasischen Staatlichen Biosphärenreservates (Westkaukasus, Rußland). – Herzogia **33**: 90–138.

In sieben 1-ha-Plots entlang eines Höhengradienten in einem Urwald im Kaukasischen Staatlichen Biosphärenreservat wurden 659 epiphytische und epixyle Arten nachgewiesen. Davon sind 564 Flechten, 61 lichenicole Pilze und 34 flechtenähnliche, nicht oder fakultativ lichenisierte Pilze. 149 Arten (116 Flechten, 17 lichenicole und 16 saprobische Pilze) sind neu für den Nordkaukasus, darunter 133 Arten (104 Flechten, 15 lichenicole und 14 saprobische Pilze) neu für den Kaukasus. 50 Arten werden erstmals für Rußland dokumentiert: 37 Flechten (*Andreiomyces obtusaticus*, *Bacidina mendax*, *Biatora aegrefaciens*, *B. bacidioides*, *B. chrysanthoides*, *Biatorella dryophila*, *Buellia*

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iberica, *Cliostomum haematommatis*, *Endohyalina ericina*, *Fellhanera christiansenii*, *Gyalidea minuta*, *Lecanora barkmaniana*, *L. subravida*, *Lecidea strasseri*, *Leptogium hibernicum*, *Lithothelium hyalosporum*, *L. phaeosporum*, *L. septemseptatum*, *Loxospora cristinae*, *Melanelixia epilosa*, *Micarea nowakii*, *M. perparvula*, *Opegrapha trochodes*, *Orcularia insperata*, *Parvoplaca servitiana*, *Phylloblastia inexpectata*, *Psoroglaena stigonemoides*, *Ptychographa xylographoides*, *Ramonia dictyospora*, *R. luteola*, *Rinodina polysporoides*, *Thelopsis flaveola*, *Topelia jasonhurii*, *Verrucaria hegetschweileri*, *Wadeana minuta*, *Waynea giraltiae*), 9 lichenicole Pilze (*Arthonia vorsoeensis*, *Didymocyrtis melanelixiae*, *Epigloea urosperma*, *Muellerella polyspora*, *Phacographa zwackhii*, *Pronectria pilosa*, *Rhymbocarpus pubescens*, *Taeniolella friesii*, *Unguiculariopsis acrocordiae*) und 4 nicht lichenisierte saprophytische Pilze (*Cyrtidula major*, *Karschia cezannei*, *Kirschsteiniothelia recessa*, *Pseudotryblidium neesii*).

Der Anteil der Großflechten schwankt zwischen 26.5 und 40 % und steigt mit der Höhe. Flechten mit trentepohlioidem Photobiont sind mit 15–51 Arten pro Plot vertreten und die Anzahl sinkt mit der Höhe. Der Zahl der Blaualgenflechten ist in allen Plots substantiell (15–28 Arten), was bezeugt, daß Luftverschmutzung/Versauerung keine Rolle spielen. Geringe Artenvielfalt und geringe Abundanz nitrophiler Arten indizieren unbedeutende Immissionen von Stickstoffverbindungen. Buchen- und Tannenborke und -zweige sind die bevorzugten Substrate, doch die große Mehrheit der Flechten zeigt eine geringe Substratspezifität. Die Artenvielfalt je Plot bewegt sich zwischen 236 und 379. Die höchste Vielfalt wurde in einem Plot außerhalb des Reservates festgestellt und wir empfehlen dessen Aufnahme in das Schutzgebiet.

Key words: Biodiversity, epiphytes, hot-spots, lichen inventory, lichenized and lichenicolous fungi.

Introduction

The highest biodiversity among terrestrial biomes is associated with forests (Loo 2009). However, most woodlands in Europe today are managed plantations, often with non-native trees and with very low biodiversity. Primeval forests have become rare and are one of the most endangered habitats (Malíček et al. 2018a). The Russian North-western Caucasus is outstanding with its 1.3 million hectares of undisturbed primeval forests (Komarova 2017). 105 thousand hectares of undisturbed primeval fir and fir-beech forests are protected in the Caucasus State Nature Biosphere Reserve (Caucasus Reserve in following text, Akatov et al. 1990). The Western Caucasus is a place where endangered, rare, endemic and relict plant and animal species are concentrated (Blagovidov et al. 2006). It is one of the world's biodiversity hot-spots (Olson & Dinerstein 2002) and one of the most diverse regions in Russia (Krever et al. 2001). It forms a border between two phytogeographical regions: the Euxinian province of the Euro-Siberian region and the Hyrcanian province of the Irano-Turanian region. Its location within the mid-latitudinal temperate zone, high topographical variation and proximity to the Black Sea creates long climatic gradients ranging from subtropical conditions at low elevations to alpine and nival conditions. It also harbors a high diversity of tree species and forest types (DellaSalla et al. 2011, Martin-Benito et al. 2018).

Although lists of lichens collected in NW Caucasus have been already published by Krivorotov (1997), Urbanavichus & Urbanavichene (2004, 2014, 2015), Blinkova & Urbanavichus (2005), and Otte (2005, 2007), fir-beech virgin forests in the Caucasus Reserve are lichenologically still poorly known. Krivorotov (1997) published a lichen checklist of the NW Caucasus including about 500 species, of them about 200 species were reported from the territory of the Caucasus Reserve. Subsequent floristic research resulted in 518 species known from the Caucasus Reserve (Urbanavichus & Urbanavichene 2004). More recently, Urbanavichus & Urbanavichene (2014) published 677 species for the Lagonaki Plateau (North Division of the Caucasus Reserve), mainly from alpine habitats, but also from a small fir-pine-maple-beech forest area (about two km^2) in the northern part of the Kamennoe More (Stone Sea) Range where 330 epiphytic and epixylic species were recorded (including 30 species of lichenicolous fungi). In the Western and Southern parts of the Caucasus Reserve, lichens were studied in valleys of the rivers Achipse and Shakhe, where 122 and 135 epiphytic

and epixylic species were recorded (Urbanavichene & Urbanavichus 2014, 2016). Another 90 species of lichenicolous fungi were reported for the Caucasus Reserve by Zhurbenko & Kobzeva (2016) and Zhurbenko (2017). Altogether, 1050 species (among them about 550 epiphytic and epixylic species) have been known from the Caucasus Reserve up to date: 869 lichens, 160 lichenicolous fungi and 21 lichen-allied saprobic fungi.

In 2016, we pursued lichen inventories along an altitudinal gradient in untouched fir-beech forests of the northern part of the Caucasus Reserve, focused on local lichen diversity hotspots (following Vondrák et al. 2018). Ecological and conservational implications of the results have been published separately (Vondrák et al. 2019b), but the impressive floristic results merit a publication of its own and are published here.

Study area

The Caucasus State Nature Reserve was established in 1924 and declared as an UNESCO Biosphere Reserve in 1979 (Akatov et al. 1990). In 1999, the entire territory of the Caucasus Reserve (280 000 hectares) was included in the UNESCO World Natural Heritage Sites as "Western Caucasus". Approximately two thirds of the territory of the Caucasus Reserve is covered with virgin forests; the rest of the area is occupied by subalpine and alpine meadows, nival communities, and glaciers. Coniferous forests in the NW Caucasus are mainly formed by Nordmann fir (*Abies nordmanniana*). Fir and fir-beech forests are the predominant habitat at 600–1800 m above the sea level. Fir trees may have stunning sizes; more than 60 m in height and about two meters in diameter at breast height (Akatov et al. 1990). The eastern beech (*Fagus orientalis*) reaches smaller sizes; slightly above 40 m in height and 100 cm in diameter. Fir trees often reach 400–500 years of age, and sometimes even 700 years, the eastern beech reaches 280–300 years but sometimes even 380 years (Grabenko 2011). Trautvetter maple (*Acer trautvetteri*) is another forest dominant and other trees involved are: maple tree species (*Acer campestre*, *A. laetum*, *A. platanoides*), lime tree (*Tilia begoniifolia*), hornbeam (*Carpinus betulus*), ash (*Fraxinus excelsior*), birch (*Betula litwinowii*, *B. pubescens*) and pine (*Pinus kochiana*, = *P. sylvestris*) (Akatov et al. 1990). Other tree and shrub species are listed at the beginning of the lichen list with abbreviations (see below).

According to the classification of terrestrial ecosystems (biomes) by Ogureeva et al. (2018), the study area belongs to the North-Western Caucasus regional orobiome of the North Caucasian group with nemoral coniferous-deciduous and deciduous forests. Altitude belts in this orobiome are: 1) piedmont oak forests dominated by common oak (*Quercus robur*) – 200–350 m a.s.l.; 2) oak forests dominated by sessile oak (*Quercus petraea*) – 350–500 m a.s.l.; 3) middle mountain forests dominated by eastern beech (*Fagus orientalis*) – 500–650 m a.s.l.; 4) middle mountain beech-fir forests with occassional occurrences of *Acer pseudoplatanus*, *Carpinus betulus*, *Tilia begoniifolia*, *Ulmus glabra* etc. – 650–1500 m a.s.l.; 5) mountain beech-fir forests with *Acer trautvetteri*, *Betula litwinowii*, *Sorbus aucuparia*, *Salix* sp. etc. – 1500–1800 m a.s.l.; 6) stunted beech-birch forests – 1800–2100 m a.s.l.; 7) subalpine belt with thickets of *Rhododendron caucasicum* and sedge-herb meadows – 1800–2300 m a.s.l. and 8) alpine belt – 2300–3000 m a.s.l. (Ogureeva 2016).

In the surveyed area, the Belaya River basin at the village Guzeripl (Fig. 1) at 670 m a.s.l., the average annual temperature is about 8.2°C (-2°C in January, 18°C in July), the annual average precipitation 1130 mm (maximum 1540 mm). At 1400–1700 m a.s.l., the average annual temperature is about 5°C, (-3°C in January, 15°C in July) and the annual average precipitation

1200 mm (maximum 2000 mm). At 1810–2020 m a.s.l., the temperature is about 3°C, (-7°C in January, 13°C in July), the precipitation 2000 mm (maximum 2800 mm; IVANCHENKO et al. 1982, AKATOV 2009).

There are no significant sources of air pollution at a distance of less than 70 km, which is the distance to the town of Maykop in the north.

Materials and methods

Our field research was carried out from 6th to 18th June 2016, and organized with the aim to detect a maximum number of lichen species in the study area. We concentrated efforts on epiphytic and epixylic lichen species, allied non- or facultatively lichenized fungi and lichenicolous fungi. The research was performed in seven square 1-hectare plots positioned in structurally diverse forest habitats along an altitudinal gradient from 700 to 1920 m (Fig. 1). Criteria for plot selection followed the hot-spot approach described by VONDRÁK et al. (2018). The survey was done as a multi-expert inventory by five of the authors (GU, IU, JM, JV, ZP), following methods described by VONDRÁK et al. (2016). Approximately 40 person-days were spent in the field. GPS coordinates are defined in the WGS-84 system. Specimens were identified using primarily routine methods (light microscopy and spot tests). The researchers identified their specimens individually. Selected critical specimens were checked by acknowledged specialists. Numerous specimens, especially sterile crusts, were identified using thin layer chromatography (in solvents A, B' and C) according to the methods summarized by ORANGE et al. (2001). Some specimens were

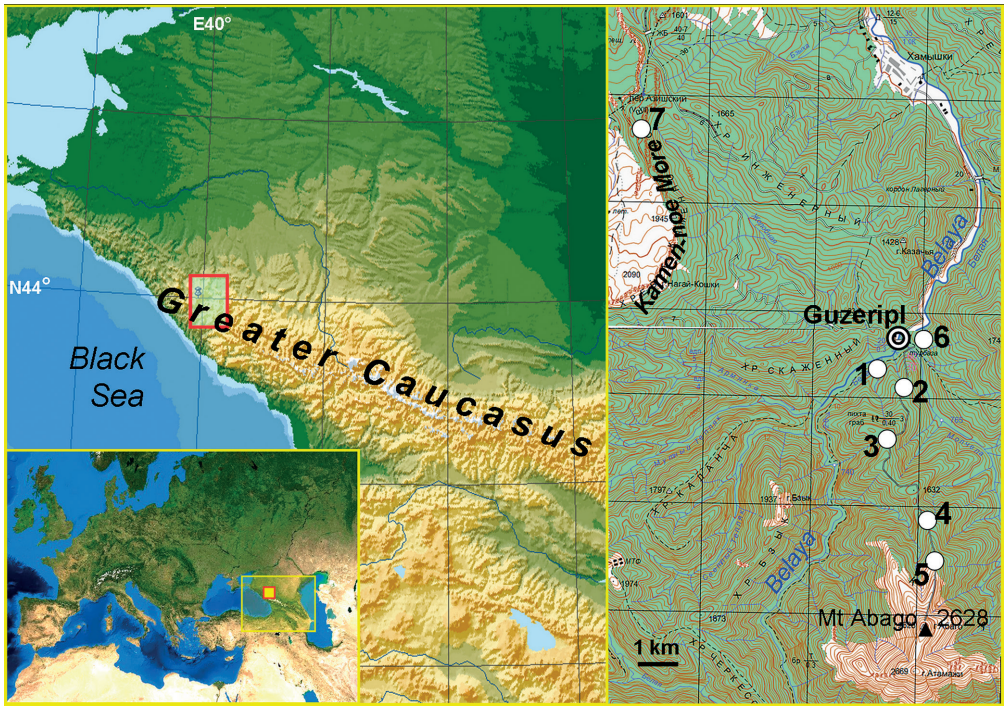

Fig. 1. Maps showing the surveyed region and locations of plots 1–7 (basis of maps: http://opengeodata.ru).

sequenced for nuclear ITS (ITS1, 5.8S, ITS2) and / or mitochondrial SSU DNA barcodes, following methods by Malíček et al. (2018b). A standard nucleotide BLASTN search (Altschul et al. 1990, Appendix) was used for a confirmation of species identity.

The list of taxa is in alphabetical order. The data presented for each species include: presence on plots, substrata, collectors and a count of voucher specimens. Voucher specimens were collected for most of the recorded species and are deposited in PRA (JV, ZP), LE (IU) and in the personal herbaria of G. Urbanavichus (GU) and J. Malíček (JM).

List of sampled 1-hectare plots

All localities are situated in Russia, Northern Caucasus, Republic of Adygea, Maykop district:

1. Caucasus Reserve, 0.5 km SW of the village Guzeripl, on flat right bank of the river Belaya, sparse (prevailing) or dense forest with frequent *Abies nordmanniana*, *Acer campestre*, *Alnus glutinosa*, *Carpinus betulus*, *Corylus avellana*, *Fagus orientalis* and *Quercus*, alt. ca. 700 m a.s.l., N43°59′19″/E40°07′30″, 6 & 8 VI 2016 (Fig. 2).
2. ibid., northern spur of Mount Abago, 1 km SE of the village Guzeripl, northern slope, dense (prevailing) or sparse forest with frequent *Abies nordmanniana*, *Carpinus betulus*, *Fagus orientalis*, *Quercus* spec. and *Tilia begoniifolia*, and with forest gaps covered by *Rhododendron ponticum* scrubs, alt. 920–960 m a.s.l., N43°59′12″/E40°08′29″, 6 & 7 VI 2016.
3. ibid., 2.8 km S of the village Guzeripl, northwestern slope, dense (prevailing) or well-lit forest dominated by *Abies nordmanniana*, *Acer trautvetteri* and *Fagus orientalis*, alt. 1450–1470 m a.s.l., N43°57′53″/E40°07′50″, 13 & 14 VI 2016.

Fig. 2. Plot 1 – forest with *Abies nordmanniana*, *Acer campestre*, *Alnus glutinosa*, *Carpinus betulus*, *Corylus avellana*, *Fagus orientalis* and *Quercus* sp. on flat right bank of the river Belaya.

4. ibid., 6.2 km S of the village Guzeripl, northern slope, forest dominated by *Acer trautvetteri* with spots of dense forest dominated by *Abies nordmanniana* and *Fagus orientalis*, alt. 1690–1750 m a.s.l., N43°56′10″/E40°08′52″, 12 & 13 VI 2016.
5. ibid., 7.4 km SW of the village Guzeripl, northern slope, subalpine sparse forest dominated by *Betula litwinowii*, with single trees of *Abies nordmanniana* and *Fagus orientalis* and with spots of *Rhododendron caucasicum* scrubs, alt. 1890–1920 m a.s.l., N43°55′35″/E40°09′06″, 11 & 12 VI 2016.
6. ibid., 0.3 km E of the village Guzeripl, western slope, dense (prevailing) or sparse forest dominated by *Abies nordmanniana* and *Fagus orientalis*, with a forest gap covered by *Rhododendron ponticum* scrubs, alt.710–740 m a.s.l., N44°00′02″/E40°08′38″, 15 VI 2016.
7. Lagonaki Highland, northern part of the Kamennoe More Ridge, 0.7 km SE of the Azishskii pass, mixture of dense and sparse forest habitats with high tree species richness on limestone bedrock with numerous, abundant trees: *Abies nordmanniana*, *Acer trautvetteri*, *Betula litwinowii*, *Fagus orientalis*, *Sorbus aucuparia*, *Salix caprea*, *Taxus baccata*, *Ulmus glabra*, and also *Pinus kochiana*, alt. 1820–1840 m a.s.l., N44°04′40″/E40°00′51″, 16, 17 & 18 VI 2016 (Fig. 3). This site is not protected. It is situated 150 m beyond the northern boundary of the Caucasus Reserve.

Results

New records for Russia, Caucasus or North Caucasus are indicated as R, C and NC, respectively, before the name of the respective species. The nomenclature mainly follows Nimis et al. (2018), Urbanavichus (2010) [absent taxa in the previous reference] and Lawrey & Diederich (2018), except the taxa from the families Ramalinaceae and Teloschistaceae (Arup

Fig. 3. Plot 7 – mixed forest with predominant *Abies nordmanniana*, *Acer trautvetteri* and *Betula litwinowii* on limestone bedrock in the northern part of the Kamennoe More Ridge, Lagonaki Highland.

et al. 2013, Kistenich et al. 2018) along with few relevant recent novelties (Aptroot et al. 2018, Søchting & Arup 2018, Ekman et al. 2019). Several recently described taxa not involved or not distinguished in the above mentioned works are discussed below the respective taxon and amended with a reference. Substrate and abbreviations:

AC – *Acer campestre*, AG – *Alnus glutinosa*, AN – *Abies nordmanniana*, AP – *Acer platanoides*, AT – *Acer trautvetteri*, BL – *Betula litwinowii*, CA – *Corylus avellana*, CB – *Carpinus betulus*, FE – *Fraxinus excelsior*, FO – *Fagus orientalis*, IC – *Ilex colchica*, JC – *Juniperus communis*, LO – *Lonicera* sp., PK – *Pinus kochiana*, QU – *Quercus* sp., RP – *Rhododendron ponticum*, SA – *Sorbus aucuparia*, SC – *Salix caprea*, SN – *Sambucus nigra*, ST – *Sorbus torminalis*, TB – *Taxus baccata*, Ti – *Tilia begoniifolia*, UG – *Ulmus glabra*, VA – *Vaccinium arctostaphylos*, VO – *Viburnum orientale*, bry – bryophytes, le – leaves, ne – needles, tw – twigs.

Lichens

Absconditella lignicola Vězda & Pišút – 1, 2, 3, 4, 5, 6, 7: log, snag, stump (GU5, IU9, JM2, JV7, ZP4).

Acolium inquinans (Sm.) A.Massal. – 4: AN/snag (JM1, ZP1).

Acrocordia cavata (Ach.) R.C.Harris – 1, 7: AN, AT, CB, FE, SN (GU2, IU1, JM1, JV2, ZP2).

Acrocordia gemmata (Ach.) A.Massal. – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, CA, CB, FO, QU, Ti, UG (GU11, IU4, JM4, JV7, ZP11).

Agonimia allobata (Stizenb.) P.James – 1, 2, 3, 5, 6: AN, FO, QU, Ti (IU1, JM2, JV6, ZP5).

Agonimia borysthenica Dymytrova, Breuss & S.Y.Kondr. – 1, 2, 6: AG, FO, stump (GU2, JM3, JV3, ZP6). The species was recorded only in 'lowland' forest plots below 1000 m. Quite recently it has been reported as new to Russia and Caucasus from Caspian forests in Dagestan (Ismailov et al. 2017).

Agonimia flabelliformis Halda, Czarnota & Guz.-Krzem. – 1, 2, 6: AG, AN, log, stump (GU3, IU1, JM2, JV5, ZP3).

Agonimia repleta Czarnota & Coppins – 1, 2, 3, 4, 5, 6: AG, AN, AT, CB, FO, UG (GU2, IU3, JM2, JV9, ZP6).

Agonimia tristicula (Nyl.) Zahlbr. – 1, 2, 3, 4, 7: AT, FO, QU, Ti, UG (IU1, JM4, JV4, ZP6).

Agonimia vouauxii (B. de Lesd.) M.Brand & Diederich – 7: UG/bry (JV1).

Alectoria sarmentosa (Ach.) Ach. – 3: AN (IU1, JV1).

Alyxoria ochrocheila (Nyl.) Ertz & Tehler – 4: FO (JM1, JV1).

Alyxoria varia (Pers.) Ertz & Tehler – 1, 2, 3, 4, 6, 7: AN, AP, AT, CB, FE, FO, QU, UG, log, snag (GU13, IU12, JM2, JV15, ZP5).

Amandinea punctata (Hoffm.) Coppins & Scheid. – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, ST, TB, snag, stump (GU13, IU5, JV10, ZP4).

Amandinea aff. ***punctata*** – 4, 7: AN (JV4, ZP3). Apothecia resemble *Buellia schaereri* or *Amandinea punctata*, but yellow, K+ red pigment present in hymenium. Specimens were seen by H. Mayrhofer, but left unidentified. The mtSSU sequence of the sample JV16429 is very distinct from sequences of *B. schaereri* and *A. punctata*; sequences of *Diplotomma* species are the most similar (97 % similarity) according to the BLASTN-search.

Anaptychia ciliaris (L.) Körb. – 2, 3, 4, 5, 7: AN, AT, BL, FO, SA, Ti, UG (GU2, IU3, JM1, JV4, ZP1).

Anaptychia crinalis (Schleich.) Vězda – 1, 2, 3, 4, 7: AN, AT, FO, UG (GU4, IU2, JM1, JV4, ZP3).

RC ***Andreiomyces obtusaticus*** (Tønsberg) Hodkinson & Lendemer – 1, 2: AG, CB (JV2). TLC: obtusatic acid.

Anisomeridium biforme (Borrer) R.C.Harris – 1, 4, 6: AG, AT, CB, FO (GU3, JV1, ZP2).

Anisomeridium polypori (Ellis & Everh.) M.E.Barr – 1, 2, 3, 4, 5, 6, 7: AN, AT, CB, FO, SA (GU6, JM4, JV9, ZP7).

C ***Anzina carneonivea*** (Anzi) Scheid. – 5: BL/wood (JM2).

C ***Aquacidia trachona*** (Ach.) Aptroot – 1: QU (ZP1).

Arthonia cf. ***bueriana*** (J. Lahm ex Arnold) Zahlbr. – 4: AN (IU1, JV1, ZP1). In Russia and the Caucasus, this species was collected before from Krasnodar Territory (specimen in GLM; V. Otte in litt.). Our specimens display blackish lecideoid sessile apothecia with one-septate arthonioid ascospores and pigmented hypothecium. This is a poorly known taxon known mainly from historical records. According to Nimis et al. (2018) *A. bueriana* is a non-lichenized species. Our specimens are lichenized with trentepohlioid algae and fit best the description of this species provided in the monograph of Arthoniaceae by Redinger (1937), who regarded this taxon for a lichen containing algae of *Trentepohlia* type. Optionally the Caucasian material could represent epiphytic populations of usually saxicolous taxon *Arthonia granitophila* Th.Fr. Caucasian material deserves further study. Specimen ZP23213 is filed under the latter name in the herbarium PRA.

Arthonia didyma Körb. – 1, 2, 3, 6, 7: AN, CB, FO, SA, Ti (GU5, IU4, JM3, JV7, ZP5).

Arthonia dispersa (Schrad.) Nyl. – 1, 2, 5: AN, CA, FO (GU1, IU1, JV1).

C ***Arthonia faginea*** Müll.Arg. – 3, 4, 5, 7: AN, AT, CB, FO, SC, UG (GU1, JM4, JV8, ZP6).

Arthonia fuliginosa (Turner & Borrer) Flot. – 2: RP (ZP1). Small specimen ZP22922 with purplish-brownish pruinose ascomata. Microscopically it fits the description of this species in available keys (e.g. Redinger 1937) and it was also confirmed by A. Frisch. This species has been reported for the first time for the Caucasus and Russia from the neighbouring territory of the Republic of Adygea (Otte 2007). It is likely to be a widespread species in the Caucasian area. Richer material was collected by ZP in the Transcaucasian part of Turkey (Kackar Mts).

Arthonia helvola (Nyl.) Nyl. – 4, 7: AN, wood of snag (JM1, ZP2)

C ***Arthonia incarnata*** Th.Fr. ex Almq. – 4, 7: AN, snag (IU1, JV2).

Arthonia mediella Nyl. – 3, 4, 5, 6, 7: AN, AT, FO, SA, snag (GU3, JM2, JV3, ZP8).

C ***Arthonia patellulata*** Nyl. – 7: AT, SA (GU1, ZP1).

Arthonia punctiformis Ach. – 1, 2, 3, 4, 5, 6, 7: BL, CA, FO, SA, UG (GU1, IU1, JV9).

Arthonia radiata (Pers.) Ach. – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, SA, Ti, UG (GU17, IU11, JM2, JV13, ZP6).

Arthonia ruana A.Massal. – 1, 2: IC/tw, Q, UG/tw (JV1, ZP2).

Arthonia spadicea Leight. – 1, 2, 3, 4, 5, 6, 7: AN, AG, AT, CB, FO, QU, SC, ST, log, snag (GU6, IU2, JM1, JV6, ZP1).

Arthonia vinosa Leight. – 1, 3, 7: AN, AT, PK, snag (GU1, IU2, JV4, ZP3). Some specimens produce dark sporodochial anamorphic stages similar to those in the genus *Trimmatostroma*; sporodochia contain the same anthraquinones as in the apothecia (skyrin by TLC); apothecia were sometimes present together with sporodochia.

Arthopyrenia analepta (Ach.) A.Massal. – 1, 4, 5, 6, 7: AN/tw, FO/tw, BL, SA (GU3, JM2, JV3, ZP2).

Arthopyrenia cerasi (Schrad.) A.Massal. – 2, 7: SA/tw, Ti/tw (GU1, JV2).

Arthopyrenia salicis A.Massal. – 2, 3, 5: AN/tw, FO/tw, UG/tw (GU3, JV1).

C ***Arthopyrenia subcerasi*** (Vain.) Zahlbr. – 1, 4, 6: AT, FO/tw (GU1, JV2).

C ***Arthothelium scandinavicum*** Th.Fr. – 3, 4, 6, 7: AN, AT (GU2, IU1, JM3, JV7, ZP6).

Arthothelium spectabile Flot. ex A.Massal. – 1, 2: CB, QU, Ti (JM1, JV1, ZP1).

Aspicilia cinerea auct. brit. (cf.) – 4: FO (ZP1). TLC: norstictic acid. The specimen ZP21467 was collected at complete basis of leaning *Fagus*. The identification is tentative because no apothecia were developed in the voucher. Distinct pale grey rimose-areolate thallus bordered with dark grey-green glossy prothallus and pycnidia containing relatively long conidia, c. 10–15 × 1 µm, suggest this broadly circumscribed, primarily saxicolous taxon following Fletcher et al. (2009).

Athallia cerinelloides (Erichsen) Arup, Frödén & Søchting – 4, 7: AT, FO, LO, VO (IU1, JM1, JV4, ZP3).

Athallia pyracea (Ach.) Arup, Frödén & Søchting – 3, 4, 5: AT, SN (JM1, JV2).

Bacidia absistens (Nyl.) Arnold – 1: AG (IU1).

Bacidia albogranulosa Malíček, Palice, Vondrák & Kukwa – 1, 2, 3: AC, AP, CB, FE, FO, QU (JM3, JV3, ZP10). Our specimens are paratypes of this recently described sterile species; known also from Central and Eastern Europe (see Malíček et al. 2018a).

Bacidia arceutina (Ach.) Arnold – 1, 2, 6: AC, AG, AN, CA, CB, FE, FO, QU, Ti, UG, log (GU8, IU1, JM3, JV7, ZP7).

Bacidia biatorina (Körb.) Vain. – 1, 2: AN, FO, QU, RP (GU1, IU2, ZP1).

Bacidia fraxinea Lönnr. – 1, 3, 6: AN, AT, SN (GU1, IU2, JM2).

Bacidia friesiana (Hepp) Körb. – 1, 3, 6: AN, FO, SN (GU3, IU1, JM2, JV2, ZP1).

Bacidia laurocerasi (Delise ex Duby) Zahlbr. – 1, 2, 3, 6: AG, AN, CA, CB, FO, RP, UG (GU5, JM2, JV5, ZP7).

Bacidia polychroa (Th.Fr.) Körb. – 1, 2: AC/tw, AP, CA, CB, FE, SN (GU2, IU4, JV4, ZP2).

C ***'Bacidia' propinqua*** (Stizenb.) Arnold – 1: CA (ZP1). Det. S. Ekman. Traditionally seen as a synonym of *Bilimbia sabuletorum* but it is a distinct species of the genus *Bilimbia* (S. Ekman in litt.).

Bacidia rosella (Pers.) De Not. – 1, 2, 3, 6: AN, CB, FO, Ti (GU5, IU3, JM2, JV1, ZP3).

Bacidia rubella (Hoffm.) A.Massal. – 1, 2, 3, 4, 6, 7: AN, AT, CA, FO, QU, SA, UG (GU6, IU7, JV4, ZP3).

Bacidia suffusa (Fr.) A.Schneid. – 1: AN (IU1).

Bacidina apiahica (Müll.Arg.) Vězda – 1, 6, 7: AN/ne (GU2, IU1, ZP1).

Bacidina assulata (Körb.) S.Ekman – 1, 2: AP, SN (GU1, IU1).

Bacidina chloroticula (Nyl.) Vězda & Poelt – 1, 2, 3, 4, 6, 7: AN/ne+tw, AT, CA/tw, CB, FO/tw, dead wood (GU3, JM2, JV4, ZP5).

Bacidina delicata (Larbal. ex Leight.) V.Wirth & Vězda s. lat. – 1, 6: CB, FO, SN (GU2, JV1).

RC ***Bacidina mendax*** Czarnota & Guz.-Krzem. – 1, 6: AC/tw, AN/tw, CA, UG/tw (JM1, JV3, ZP3). *B. mendax* is new to Russia, but the record of *B. neosquamulosa* from the Leningrad region may belong to that species as its image and short description provided by Himelbrant et al. (2017) fit better to *B. mendax* (Czarnota & Guzow-Krzemińska 2018).

C ***Bacidina modesta*** (Zwackh ex Vain.) S.Ekman – 1, 4: FO, UG, stump (IU1, JV1, ZP1).

Bacidina phacodes (Körb.) Vězda – 1, 2, 3, 4, 6: AN, AP, CA, FO, Ti (GU4, IU3, JM4, JV7, ZP8).

Bacidina pycnidiata (Czarnota & Coppins) Czarnota & Guz.-Krzem. – 1, 3, 4, 6, 7: AT/bry, FO/liverworts, LO, log, snag (GU1, JM1, JV6, ZP3).

Bactrospora dryina (Ach.) A.Massal. – 1, 6: AN, AG, QU (GU2, IU2, JM3, JV2, ZP1).

Bellicidia incompta (Borrer) Kistenich, Timdal, Bendiksby & S.Ekman – 1, 2, 3, 4, 7: AN, CB, FO (GU1, IU1, JM3, JV2, ZP2).

RC ***Biatora aegrefaciens*** Printzen – 3: AN/wood of branch (ZP1). It is a well recognizable species within the genus due to its three-septate ascospores, amyloid (I + bluish) exciple and presence of gyrophoric acid in apothecia (PRINTZEN 1995). Although easily identifiable, it is a rarely recorded species known so far from nine published specimens from northern Sweden, Alaska and Transcaucasian Turkey (PRINTZEN 1995, PRINTZEN et al. 2002, MCCUNE et al. 2018). The taxon is a promising bioindicator species. Due to its rarity and ecological requirements it was suggested to be a relictual old-growth forest species (PRINTZEN et al. 2002).

Biatora albohyalina (Nyl.) Bagl. & Carestia – 1, 2, 3: AN, snag (GU1, IU2, ZP2).

RC ***Biatora bacidioides*** Printzen & Tønsberg – 1, 2: CB (JM1, ZP1). TLC: gyrophoric acid, argopsin. This sorediate taxon with affinities to *Biatora beckhausii* was described from *Picea orientalis* forests in the Transcaucasian part of Turkey (Kackar Mts, PRINTZEN & TØNSBERG 2003) hence the presence in the Caucasus was expected. Recently it was recorded also from humid *Fagus sylvatica* forests in the Eastern Carpathians (MALÍČEK et al. 2018b, VONDRÁK et al. 2018). The collected Caucasian material was sterile and identified by its extensively sorediate thalli containing both gyrophoric acid and argopsin.

Biatora beckhausii (Körb.) Tuck. – 1, 3, 4, 5, 7: AN, AT, BL, CB, FO, SA, log, snag (GU7, IU2, JM3, JV6, ZP8).

C ***Biatora chrysantha*** (Zahlbr.) Printzen – 1, 2, 4, 5, 7: AN, AT, BL, FO, RP, log (GU1, IU7, JM9, JV10, ZP8). TLC: gyrophoric acid. Identity of one sterile specimen (JV16141) confirmed by ITS sequence. Since the majority of vouchers is sterile, we cannot exclude that a part of the material from higher altitudes belongs to the following species.

RC ***Biatora chrysanthoides*** Printzen & Tønsberg – 5: BL, snag (JM1, ZP4). TLC: gyrophoric acid in the thallus as well as in apothecia (C+ fleetingly reddish). This is likely a northern species. It was recorded only in the subalpine forest plot during our survey. The species has been reported only once (Sweden, EKMAN et al. 2019) since the original description from northern Norway and Pacific North America (PRINTZEN & TØNSBERG 2003). It is morphologically hardly distinguishable from *Biatora chrysantha*, if not fertile. Fortunately, the Caucasian specimens are fertile and with apothecia containing gyrophoric acid, the main discriminating feature from *Biatora chrysantha* (PRINTZEN & TØNSBERG 2003).

Biatora efflorescens (Hedl.) Räsänen – 3, 4, 5, 7: AG, AN, AT, BL, CB, FO, PK, SA, TB, log, snag (GU15, IU19, JM5, JV11, ZP15). The specimen on wood of snag (JV16449) with unusual phenotype resembling *Violella fucata*. Identification confirmed by ITS sequence data.

Biatora fallax Hepp – 4, 5, 7: AN, BL, snag (IU1, JM1, JV7, ZP1).

Biatora globulosa (Flörke) Fr. – 2, 3, 4, 5, 7: AN, AT, BL, FO, PK, Ti, log, snag, stump (GU4, IU2, JM2, JV8, ZP12).

Biatora helvola Körb. ex Hellb. – 7: FO (ZP1).

Biatora meiocarpa (Nyl.) Arnold – 7: AN/tw (ZP1). The specimen ZP23254 is macroscopically similar to *B. helvola* or extreme morphs of *Lecania cyrtella* s. lat. with a receding thalline margin, but with distinct, almost rectangular lumina of excipular hyphae as large as 7 × 3.5 µm in water, enlarged paraphyse-tips and presence of filiform conidia (30 × 1.5 µm). The species was identified based on the description in EKMAN (1994).

Biatora aff. ***meiocarpa*** – 5: FO (ZP1). The specimen ZP23529 is a non-sorediate taxon with an immersed thallus and small pallid apothecia containing small ellipsoid ascospores, not exceeding 10 × 3.5 µm.

Apparently a member of the *B. meiocarpa*-group (sensu Printzen 2014) based on the exciple character and enlarged paraphyses ends.

Biatora mendax Anzi – 1, 2, 3, 4, 5, 6, 7: AN, BL, CB, FO, QU, RP, UG (GU10, IU1, JM4, JV8, ZP22).

Biatora ocelliformis (Nyl.) Arnold – 1, 2, 3, 4, 6, 7: AN, AP, AT, CB, FO, RP, SA, TB, log, snag, stump (GU12, IU5, JV5, ZP11).

Biatora pontica Printzen & Tønsberg – 1, 2, 3, 6: AG, AN, CB, FO, RP, UG (GU5, IU2, JM8, JV5, ZP8). TLC: thiophanic acid, asemone, ±additional xanthone in traces, pontica unknown. Fertile specimens were collected in lowland sampling plots. The identification of two sterile specimens (JM10212, JV17846) was supported by mtSSU and ITS sequences.

Biatora radicicola Printzen, Palice & J.P.Halda – 4: FO (ZP5). One of the Caucasian specimens is paratype of the species (ZP21105). The characteristic ecology, e.g. exposed roots and bases of trees subjected to water spray and/or sites with a prolonged snow cover (see Printzen et al. 2016) was emended by records from Sweden on sheltered rocks in montane areas (Ekman et al. 2019).

C ***Biatora vacciniicola*** (Tønsberg) Printzen – 5: FO (JM1, ZP1). TLC: gyrophoric acid. Sterile specimens were compared to typical vouchers from Scandinavia. It is a mostly northern species preferring open subalpine forests. It is known mainly from northern Europe and higher central European mountains (Printzen 1995, Printzen & Palice 1999, Palice et al. 2018) reaching to Northern Ural Mts on the northeast (Hermansson et al. 2006). The present findings considerably enlarge the known European range of the species to the southeast.

Biatora vernalis (L.) Fr. – 1, 6: AG/bry, CB, FO/bry (IU2, JM2, JV2, ZP2).

Biatora veteranorum Coppins & Sérus. – 1, 2, 3, 7: AN, snag, stump (GU3, IU2, JM2, JV4, ZP3).

RC ***Biatorella dryophila*** (Almq.) Th.Fr. – 7: UG (JV1). Thallus inconspicuous; apothecia black, convex, without margin, 0.15–0.2 mm diam.; epithecium granular, K+ purple; spores globose 1.2–2 µm diam. Until now known only from the locus clasicus, on the bark of oak trees in Sweden. According to Poelt & Vězda (1977) and Foucard (2001), it is possibly a blackened form of *Piccolia ochrophora*, but we consider it a separate species.

Biatoridium delitescens (Arnold) Hafellner – 1: AC/branch (ZP2). Only recently recorded for the first time from the Caucasus (Urbanavichene & Urbanavichus 2016)

Biatoridium monasteriense J.Lahm ex Körb. – 1, 2, 3, 4, 5, 6, 7: AT, FO, UG (GU3, IU1, JM3, JV6, ZP5). Only recently recorded for the first time from the Caucasus (Urbanavichene & Urbanavichus 2018).

C ***Bibbya vermifera*** (Nyl.) Kistenich, Timdal, Bendiksby & S.Ekman – 4: AN/snag (JM1, ZP1).

Bilimbia microcarpa (Th.Fr.) Th.Fr. – 1, 5, 7: FO, UG (JM1, JV1, ZP2).

Bilimbia sabuletorum (Schreb.) Arnold – 1, 2, 3, 4, 5, 7: AC, AN, AP, AT, CA, FO/bry, QU, UG/bry (GU2, IU2, JM2, JV9, ZP7).

Blastenia anatolica Halıcı, Arup & Vondrák – 4, 5, 7: AN, BL (IU1, JV1, ZP4). Our specimen ZP21647 is a paratype of the species (Vondrák et al. 2019a) known from the Caucasus and some Turkish mountains.

Blastenia herbidella (Hue) Servít – 2, 3, 4, 5, 7: AN/tw, AP, AT, BL, CB, FO, RP, SA, snag (GU10, IU18, JM1, JV11, ZP4). Identification of four specimens confirmed with ITS sequences (Vondrák et al. 2019a).

Blastenia hungarica (H.Magn.) Arup, Søchting & Frödén – 2, 3, 5, 7: AN/tw, CB/tw, FO/tw, TB/tw (GU1, IU1, JM1, JV2, ZP1).

Bryobilimbia hypnorum (Lib.) Fryday, Printzen & S.Ekman – 1: log (IU1).

Bryobilimbia sanguineoatra (Wulfen) Fryday, Printzen & S.Ekman s. lat. – 2, 3, 4, 5, 6, 7: AN, BL, CB, FO/bry, log (IU3, JM4, JV9, ZP6). Distinguished from *B. hypnorum* by mainly simple, narrowly ellipsoid ascospores, < 5 µm wide, with a smooth instead of a warted perispore (Fryday et al. 2014).

Bryoria americana (Motyka) Holien – 5: BL (IU1, JM1).

Bryoria bicolor (Ehrh.) Brodo & D.Hawksw. – 7: BL (GU2, JM1).

Bryoria capillaris (Ach.) Brodo & D.Hawksw. – 2, 3, 4, 5, 7: AN, AT, FO, RP – mainly tw (GU2, IU2, JM4, JV2, ZP3).

Bryoria fuscescens (Gyeln.) Brodo & D.Hawksw. – 2, 3, 4, 5, 7: AN, AT, BL – mainly tw (GU3, IU6, JM3, JV3, ZP2).

Bryoria implexa (Hoffm.) Brodo & D.Hawksw. – 3, 4, 5, 7: AN, AT, PK, SA, SC – mainly tw (GU3, IU4, ZP3).

Bryoria kuemmerleana (Gyeln.) Brodo & D.Hawksw. – 5, 7: AN, BL (IU2).

Bryoria nadvornikiana (Gyeln.) Brodo & D.Hawksw. – 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, PK, QU, SA, log (GU17, IU12, JM3).

Bryoria smithii (Du Rietz) Brodo & D.Hawksw. – 7: BL (GU1). Soredia mixed with short spinules and a negative Pd spot reaction. It resembles *B. bicolor*, but that species lacks soralia and is Pd+ red.

Bryoria vrangiana (Gyeln.) Brodo & D.Hawksw. – 4, 7: AN (IU3).

Bryostigma muscigenum (Th.Fr.) Frisch & G.Thor (incl. *Arthonia microsticta* Vain.) – 1, 2: AN/ne (GU2, IU1, JV1, ZP3); 4, 7: AN, FO/bry, log (JM2, JV4, ZP2). Specimens on *Abies* needles may be referrable to *Arthonia microsticta*, but *B. muscigenum* and *A. microsticta* are possibly conspecific. Coppins & Aptroot (2009) describe an wide range of substrata for *B. muscigenum* (sub *Arthonia muscigena*) including *Abies* needles for *B. muscigenum*. Identity of one specimen on wood (ZP21403) confirmed by A. Frisch.

C ***Buellia arborea*** Coppins & Tønsberg – 7: BL, PK/wood, snag (ZP2). The identification of the sterile sorediate specimen ZP22088 was confirmed by TLC (atranorin, placodiolic acid). By its delimited (semi-)urceolate soralia the species is quite similar to *Buellia griseovirens* and *Xylographa vitiligo* when sterile, but well recognizable by its chemistry. It preferably grows on hard, slowly decaying wood of conifers (Tønsberg 1992a).

Buellia disciformis (Fr.) Mudd – 2, 3, 4, 5, 7: AN, AT, BL, FO, SC (GU4, IU5, JM2, JV9, ZP7).

Buellia erubescens Arnold – 1, 2, 6, 7: CB, FO, Ti, UG, stump (GU4, IU2, JM2, JV5, ZP1).

Buellia griseovirens (Turner & Borrer ex Sm.) Almb. – 1, 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, PK, RP, TB, log, snag, stump (GU14, IU8, JM5, JV8, ZP9). TLC: atranorin, norstictic acid.

RC ***Buellia iberica*** Giralt – 4, 7: AT (GU1, IU1, JM2). Thallus whitish, K+ yellow (atranorin); large ascospores of *Callispora*-type, 17–23 × 8.5 µm, with microrugulate surface; hymenium without oil droplets.

Buellia schaereri De Not. – 3, 4, 7: AN, AT, snag (GU3, JM3, JV6, ZP6).

Byssoloma leucoblepharum (Nyl.) Vain. – 1, 6: AN/ne+tw, FO/wood (GU4, IU2, JM1, JV4, ZP4).

Calicium glaucellum Ach. – 2, 3, 4, 7: PK/wood, SA/wood, snag, stump (GU4, IU3, JM2, JV6, ZP4).

Calicium lenticulare Ach. – 3, 4, 6, 7: FO, PK/wood, snag, stump (GU2, IU3, JM2, JV3, ZP1).

C ***Calicium parvum*** Tibell – 7: AN/wood (IU1).

Calicium salicinum Pers. – 1, 2, 3, 4, 6, 7: AN, AT/wood, BL, CB, log, snag, stump (GU12, IU4, JM5, JV3, ZP4).

Calicium trabinellum (Ach.) Ach. – 7: AN/wood, PK/wood, snag, stump (GU1, IU2, JM1, JV2, ZP2).

Calicium viride Pers. – 2, 3, 6: AN, snag (GU2, JM1, JV1, ZP1).

Caloplaca cerina (Hedw.) Th.Fr. – 1, 4, 5, 7: AN, AP, AT, BL, CA, FO, L, SA, SC, UG (GU8, IU9, JM3, JV8, ZP6).

Caloplaca haematites (Chaub.) Zwackh – 7: AT, UG/tw (IU1, JV1).

Caloplaca lucifuga G.Thor – 1, 2, 3, 6: AG, AN, AT, Ti (IU4, JM1, JV2).

Caloplaca monacensis (Leder.) Lettau – 4, 7: AT, UG (GU1, JV2, ZP2).

Caloplaca obscurella (J.Lahm ex Körb.) Th.Fr. – 7: AT (GU1).

C ***Caloplaca sorocarpa*** (Vain.) Zahlbr. – 5, 7: BL, log (JM1, JV1, ZP1).

Caloplaca stillicidiorum (Vahl) Lynge – 1, 2, 4, 7: AN/bry, AT, FO/bry, SA, SN, QU, UG/bry (GU2, IU5, JM2, JV5, ZP1).

C ***Caloplaca turkuensis*** (Vain.) Zahlbr. – 4, 7: AT, UG (JM1, JV2, ZP4). Identifications of two sterile specimens confirmed with mtSSU sequences.

Candelaria concolor (Dicks.) Stein – 7: AT (GU1).

Candelariella efflorescens R.C.Harris & W.R.Buck – 1, 2, 4, 5, 6, 7: AG, AN, AT, BL, CB, FO, RP, UG (GU8, IU3, JM2, JV2, ZP1).

Candelariella faginea Nimis, Poelt & Puntillo – 2, 4, 5, 6, 7: AN, AT, BL, FO, UG (GU10, IU11, JM3, JV7).

Candelariella lutella (Vain.) Räsänen – 2, 5: AN, FO, SA (GU2, JM1, ZP1).

Candelariella xanthostigma (Ach.) Lettau – 2, 3, 4, 5, 7: AN, AT, BL, FO, SA, UG (GU5, IU1, JM1, JV6, ZP7).

Catillaria nigroclavata (Nyl.) Schuler – 1, 2, 3, 4, 6, 7: AG, AN/+ne, CA, CB, FO, QU, RP, SN, Ti, UG – mostly tw, dead wood (GU10, IU2, JM3, JV7, ZP8).

Catinaria atropurpurea (Schaer.) Vězda & Poelt – 1, 2, 3, 4, 6, 7: AC, AN, AT, FO, SA, log, snag, stump (GU5, JM2, JV8, ZP9). The specimen JV15993 from plot 4 was identified as *Catinaria* aff. *atropurpurea*: thallus thick, olive-green to brown, areolate-granular; ascospores with a distinct ornamentation (maybe identical with the taxon in the note below *C. atropurpurea* in Gilbert (2009).

Cetraria islandica (L.) Ach. – 5: BL (IU1).

Cetraria sepincola (Ehrh.) Ach. – 5: BL (GU1, IU2, JM1, JV1, ZP2).

Cetrelia cetrarioides (Delise ex Duby) W.L.Culb. & C.F.Culb. – 1, 2, 3, 5, 6, 7: AN, BL, CB, FO, RP, SC (GU6, IU5, JM2, JV4, ZP2). TLC: atranorin, perlatolic acid, anziaic acid, 4-O-methylolivetoric acid.

Cetrelia chicitae (W.L.Culb.) W.L.Culb. & C.F.Culb. – 1, 2: CB, FO, QU, log (GU1, IU3, JV1, ZP1). TLC: atranorin, alectoronic acid, α-collatolic acid.

Cetrelia monachorum (Zahlbr.) W.L.Culb. & C.F.Culb. – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CA, CO, FO, RP, SC, Ti, UG (GU8, IU2, JM7, JV6, ZP15). TLC (A, B', C): atranorin, imbricaric acid, perlatolic acid, anziaic acid, 4-O-dimethylimbricaric acid.

Cetrelia olivetorum (Nyl.) W.L.Culb. & C.F.Culb. – 1, 2, 4, 5, 6, 7: AG, AN, AT, BL, CB, FO, RP, SC, Ti, UG (GU13, IU9, JM3, JV3, ZP6). TLC: atranorin, olivetoric acid, anziaic acid, 4-O-demethylmicrophyllinic acid.

Chaenotheca brachypoda (Ach.) Tibell – 2, 3, 4: AN, snag (JM1, JV1, ZP1).

Chaenotheca brunneola (Ach.) Müll.Arg. – 1, 2, 3, 4, 7: BL/wood root, snag, stump (GU2, IU3, JM1, JV1, ZP2).

C ***Chaenotheca chlorella*** (Ach.) Müll.Arg. – 4: wood (JM1).

Chaenotheca chrysocephala (Turner ex Ach.) Th.Fr. – 2, 3, 4, 6, 7: AN, PK/wood, snag (GU4, IU2, JV2).

Chaenotheca ferruginea (Turner ex Sm.) Mig. – 2, 7: AN, PK/wood (GU1, JV1).

Chaenotheca furfuracea (L.) Tibell – 2, 4, 6, 7: AN, AT, BL/wood root, FO, snag (GU2, IU1, JV1).

Chaenotheca gracilenta (Ach.) Mattsson & Middelb. – 1, 4, 7: AC, AN, AT (ZP1).

Chaenotheca hispidula (Ach.) Zahlbr. – 1, 2, 4, 7: AN, AT, QU, snag (GU2, IU1, JM2, JV3, ZP2).

Chaenotheca laevigata Nádv. – 2, 4, 6, 7: AN, PK, QU (IU2, JV2).

Chaenotheca phaeocephala (Turner) Th.Fr. – 4, 6, 7: AN, log, snag (GU1, IU2, JM2, JV3, ZP4).

Chaenotheca stemonea (Ach.) Müll.Arg. – 2, 3, 4, 5, 6, 7: AN, BL/wood root, FO, PK, QU (GU2, IU2, JM3, JV6).

Chaenotheca trichialis (Ach.) Th.Fr. – 2, 3, 4, 6, 7: AG, AN, AT, CB, PK, snag, stump (GU5, IU4, JV3).

Chaenotheca xyloxena Nádv. – 1, 2, 3, 4, 6, 7: AN, BL/wood root, snag, stump (GU5, IU3, JM3, JV4, ZP1).

Cheiromycina flabelliformis B.Sutton – 2, 4, 5, 7: AN/snag, BL/log with bark, SA/wood, log (GU3, IU2, JM3, JV4, ZP4). Two specimens from the collections for this project (ZP21103, 21313) were listed in the phylogenetic study by Muggia et al. (2017).

Cheiromycina petri D.Hawksw. & Poelt – 1, 2, 3, 4, 5, 7: AN, BL, FO, log, stump (GU2, JV4, ZP4). Two specimens from the collections for this project (ZP 21311, 21312) were listed in the phylogenetic study by Muggia et al. (2017).

C ***Cheiromycina reimeri*** Printzen – 2: snag (ZP1). This taxon was expected to occur in the Great Caucasus since it was described from the Kackar Mts – the Trancaucasian part of Turkey (Printzen 2007). The identification is tentative because the conidia are getting brown in part; otherwise the conidia fit well to the description by Printzen (2007), i.e. short terminal branches, extralarge conidiogenous cell etc.

Chrysothrix caesia (Flot.) Ertz & Tehler – 1: AN/tw (ZP1).

Chrysothrix candelaris (L.) J.R.Laundon – 1, 2, 3, 4, 6, 7: AG, AN, AP, AT, CB, FO, PK, QU, Ti, snag, stump (GU19, IU16, JV4, ZP4).

Cladonia caespiticia (Pers.) Flörke – 1, 4: AG, FO, log, snag, stump (IU1, JV3).

Cladonia carneola (Fr.) Fr. – 5: BL (ZP1).

Cladonia cenotea (Ach.) Schaer. – 2, 3, 5, 7: BL, PK, SA, log, stump (IU2).

Cladonia chlorophaea (Flörke ex Sommerf.) Spreng. – 1, 2, 3, 4, 5, 7: AN, AT, BL, log, stump (GU1, IU1, JM3, ZP1).

Cladonia coccifera (L.) Willd. – 7: AN (ZP1).

Cladonia coniocraea (Flörke) Spreng. – 1, 2, 3, 4, 5, 6, 7: AG, AN, BL, CB, FO, PK, SC, UG, log, snag, stump (GU11, IU19).

Cladonia digitata (L.) Hoffm. – 1, 2, 3, 4, 5, 7: BL, log, snag, stump (IU1, JV1).

Cladonia fimbriata (L.) Fr. – 2, 3, 4, 5, 6, 7: AN, AT, BL, FO, RP, SC, log, snag (GU1, IU1, JM2, ZP1).

Cladonia macilenta Hoffm. – 1, 3, 4, 7: snag, stump (JV1, ZP1).

Cladonia merochlorophaea Asahina – 3: FO (JV2).

Cladonia norvegica Tønsberg & Holien – 1: log, stump (IU1).

C ***Cladonia novochlorophaea*** (Sipman) Brodo & Ahti – 5: AN (IU1). TLC: sekikaic and homosekikaic acids. Differs from *C. homosekikiaca*, which has the same chemistry, by esorediate podetia with a well-developed, verrucose cortex.

Cladonia ochrochlora Flörke – 4, 5, 7: AN, BL, SA, log, snag (IU3).

Cladonia parasitica (Hoffm.) Hoffm. – 1: QU, log, stump (IU2, JV1, ZP1).

Cladonia pleurota (Flörke) Schaer. – 7: AN, snag (IU1, JV1).

Cladonia pyxidata (L.) Hoffm. – 2, 4, 5, 7: AT, BL, FO, QU, SC, snag (GU2, IU3, JV2, ZP1).

Cladonia squamosa Hoffm. – 2, 5, 7: BL, PK, RP, SA (IU1).

Cliostomum corrugatum (Ach.: Fr.) Fr. – 2, 3, 4, 7: AN, AP, AT, BL, PK, QU, snag, stump (GU8, IU7, JM3, JV5, ZP5).

Cliostomum griffithii (Sm.) Coppins – 1, 2, 3, 4, 6, 7: AN, snag (GU2, IU2, JM3, JV2, ZP3).

RC ***Cliostomum haematommatis*** (Keissl.) D.Hawksw., Earl.-Benn. & Coppins – 1, 2, 6: CB, FO (JM3, ZP5). TLC & LC-MS: atranorin and 2'-O-methylperlatolic acid (or its close derivative), sometimes with two related compounds visible on TLC plates. The BLASTN-search did not find a very close match to our sequences. The most similar sequences belonged to *Ramalina* species and *Lecania baeomma*; their identity and coverage were ≤93 % for mtSSU and ≤86 % for ITS (coverage 93–100 %). Morphology and chemistry correspond well to the type material of *C. haematommatis* except the missing pycnidia in the Caucasian material. This sorediate species is otherwise known from Austria (Hawksworth et al. 2006) and Switzerland (Dietrich & Malíček 2019).

Coenogonium luteum (Dicks.) Kalb & Lücking – 1, 2, 3, 4: AN, AG, FO (often switching to bryophytes) (GU1, JM1, JV2, ZP3).

Coenogonium pineti (Ach.) Lücking & Lumbsch – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, BL, FO, UG, log, snag (GU13, IU7, JM2, JV5, ZP2).

Collema flaccidum (Ach.) Ach. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CA, CB, FO, QU, SA, UG (GU7, IU8, JV3, ZP8).

Collema furfuraceum (Arnold) Du Rietz – 7: AN, AT (GU1, IU2, ZP1).

Collema nigrescens (Huds.) DC. – 2, 3, 4, 5, 7: AT, BL, FO, QU, SA, SC, UG (GU4, IU5, JM3, JV5, ZP2).

Collema subflaccidum Degel. – 1, 2, 3, 4, 6, 7: AN, AT, CA, CB, FE, FO, QU AT, FO, UG (GU7, IU5, JM3, JV3, ZP3).

Collema subnigrescens Degel. – 3, 5, 7: AT, BL, FO, SA, SC, UG (GU4, IU5, JV1).

C ***Dictyocatenulata alba*** Finley & E.F.Morris – 3, 4, 5, 6: AN, FO (GU1, IU1, JM1, JV1, ZP3).

Elixia flexella (Ach.) Lumbsch – 4, 7: AN/snag, PK/snag (GU1, ZP2).

Enchylium tenax (Sw.) Gray – 7: UG/bry (JV1).

RC ***Endohyalina ericina*** (Nyl.) Giralt, van den Boom & Elix – 7: AN (ZP1). This is an oceanic species, occurring locally along the Atlantic coast of Europe as far north as Ireland and of America as far south as Brazil. In the Mediterranean region it is known from Spain (Balearic Islands), France (Corsica) and Italy (Giralt et al. 2010, Atienza et al. 2014, Nimis 2016). This record is quite unexpected as the species was recorded at a relatively high elevation. Nevertheless, the Lagonaki locality is climatically unique hosting also other oceanic lichen species with mostly Mediterranean distribution which are

otherwise rare in the Caucasus (Urbanavichus & Urbanavichene 2014). The present material fits well the description given by Giralt et al. (2010) in having a distinct grey verrucose thallus and buellioid apothecia with dark brown hypothecium with a greenish pigmentation towards subhymenium. Apothecia in section show inspersion by oily granules; characteristic two-celled ascospores are thickened both apically as well as at the septum and tend to be paler towards the ends. The septum is formed lately, and the ontogeny is referable to the type B. The material was too sparse for TLC analyses for confirmation of characteristic compounds (diploicin, fulgidin) and filiform conidia (characteristic for this genus) were not found, however the identification was confirmed by H. Mayrhofer.

Eopyrenula leucoplaca (Wallr.) R.C.Harris – 1: CA (GU1).

Evernia divaricata (L.) Ach. – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, PK, QU, RP, SA, SC, TB, UG, snag, stump (GU14, IU18, JV1, ZP1).

Evernia prunastri (L.) Ach. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CA, CB, FO, QU, RP, log, snag (GU14, IU5).

Fellhanera bouteillei (Desm.) Vězda – 1, 2, 6: AN/ne+tw+dead wood, CA, FO/dead wood (GU4, IU1, JM2, JV4, ZP3).

RC ***Fellhanera christiansenii*** Sérus. & Vězda – 1: AN/ne (IU1).

C ***Fellhanera gyrophorica*** Sérus., Coppins, Diederich & Scheid. – 1: FO (JV1, ZP1).

Fellhanera subtilis (Vězda) Diederich & Sérus. – 1, 3, 6, 7: AN/ne+tw (GU2, IU2, JM4, JV1).

Fellhanera viridisorediata Aptroot, M.Brand & Spier – 1, 6: AN/ne+tw (GU3, ZP1).

Fellhaneropsis myrtillicola (Erichsen) Sérus. & Coppins – 1, 6: AN/ne+tw (GU3, IU1, ZP1).

Flavoparmelia caperata (L.) Hale – 1, 2, 3, 4, 5, 6, 7: AN, BL, FO, CB, QU, RP, SA, Ti, UG, snag (GU5, IU5, JV1, ZP2).

Flavoplaca flavocitrina (Nyl.) Arup, Frödén & Søchting – 2: QU (JV1).

Frutidella furfuracea (Anzi) M.Westb. & M.Svenss. – 3, 4, 5, 7: AN, BL, FO (GU1, JM3, JV2, ZP3).

Fuscidea arboricola Coppins & Tønsberg – 1, 4, 7: AN, BL, FO, PK (JM2, JV2, ZP7).

Fuscidea cyathoides (Ach.) V.Wirth & Vězda – 2, 3: FO (JM1, JV3, ZP1).

C ***Fuscidea recensa*** (Stirt.) Hertel, V.Wirth & Vězda – 5: BL (ZP1). TLC: divaricatic acid. This usually saxicolous species may rarely switch to bark (Tønsberg 1992a). This was also the case for the sterile Caucasian specimen ZP22814 from bark of dead *Betula*.

Fuscopannaria mediterranea (Tav.) P.M.Jørg. – 1, 2, 7: AN, AT, FO, QU, Ti (GU2, IU3, JM1).

Gabura fasciculare (L.) P.M.Jørg. – 4, 5, 7: AT, BL, FO, SA, SC, UG (GU4, IU4, JM4, ZP3).

Graphis scripta (L.) Ach. s. lat. – 1, 2 (+ "*betulina*" type), 3 (+ "*pulverulenta*" type), 4, 6: AG, AN, AP, AT, CA, CB, FO, QU, Ti, UG, VA (GU20, IU12, JM2, JV9, ZP7). The recent study based on both molecular and morphological characters showed that some putative species are nested within the *G. scripta*-complex, but they do not fully correspond to the taxa that were distinguished on the basis of apothecium morphology (Kraichak et al. 2015).

Gyalecta carneola (Ach.) Hellb. – 1, 2, 3: AN, AP, AT, CB, FO, QU, RP, Ti (GU8, IU2, JM2, JV4, ZP3).

Gyalecta derivata Schuler & Zahlbr. – 3: AT, FO (IU1, JM1, JV3, ZP2). Our specimens may be identified as *Gyalecta croatica* (sensu Vězda 1958) distinguished from *G. derivata* by shorter and broader ascospores (17–28 × 4.5–6 µm) containing 4–9 cells. Our observations of some specimens from a British herbarium (E) revealed substantial variation in spore shape and septation of *G. derivata*, which included the range given for *croatica*.

Gyalecta fagicola (Hepp ex Arnold) Kremp. – 2, 3, 4, 7: AN, AT, CB, FO (IU3, JM1, ZP4).

Gyalecta flotowii Körb. – 1, 2, 3: AN, AP, CB, FO, QU (GU2, IU1, JM2, JV2, ZP2).

Gyalecta herculina (Rehm) Baloch, Lumbsch & Wedin – 2, 3, 4, 5, 7: AN, AT, FO, SA, UG (GU9, IU4, JM6, JV10, ZP12). Specimens JV15841 and JV16395 are with pycnidia. Conidia of two types: (a) bacilliform, 5 × 1 µm and (b) long and sigmoid, c. 50 × 2 µm.

Gyalecta ophiospora (Lettau) Baloch & Lücking – 4, 5, 6, 7: AN, AT, FO, SA, SC, UG (GU7, IU1, JM4, JV6, ZP6).

Gyalecta truncigena (Ach.) Hepp – 2, 3, 6: AP, CB, FO, QU (GU3, IU1, JM1, JV2, ZP6). Material from plot 2 apparently includes two taxa. Except typical *G. truncigena* with ellipsoid-fusiform ascospores, some specimens (e.g. ZP23488) produce spores approaching *G. flotowii* by the shape but are slightly pointed at the apices, more richly muriform (more than 10 cells in the optical view), and the septa are not oblique as in the latter species.

Gyalecta ulmi (Sw.) Zahlbr. – 2, 3, 6: AP, FO, QU (GU1, JM1, JV2, ZP3).

Gyalectidium setiferum Vězda & Sérus. – 1, 2, 6, 7: AN/ne+tw, RP/le (GU4, IU3, JM2, JV4, ZP3).

RC ***Gyalidea minuta*** van den Boom & Vězda – 1, 2, 4, 7: log, snag (IU1, JV1, ZP2). This apparently ephemeral species is easily overlooked, due to its small translucent apothecia. Knowledge on the species has recently been summarized by Kubiak & Malíček (2012). Our epixylic occurrence of the species is remarkable. Up to now it has been recorded only as an epiphyte on shrubs and trees in Western and Central Europe.

Gyalideopsis helvetica van den Boom & Vězda – 1, 2, 3, 4, 5, 7: AN, AT, FO/bry, QU, RP, SA, UG – mainly on wood, log, snag (GU5, IU3, JM4, JV5, ZP8).

NC ***Gyalideopsis piceicola*** (Nyl.) Vězda & Poelt – 1, 2, 3, 7: AN/tw (GU2, IU1, JV2, ZP1). In Transcaucasia, this species has recently been reported from Abkhazia (Urbanavichus & Urbanavichene 2012).

Gyalolechia flavorubescens (Huds.) Søchting, Frödén & Arup – 1: CB (JV1).

Halecania viridescens Coppins & P.James – 1, 2, 3, 4, 6: AN, CA, CB, FO, RP, UG (GU2, JM1, JV5, ZP6). In Russia and the Caucasus, this species was collected for the first time from the Republic of Adygea (specimen in GLM; V. Otte in litt.). It is an easily overlooked pioneer lichen usually growing on branches and young stems of deciduous trees, often accompanied with *Catillaria nigroclavata* and other slightly nitrophytic lichens. Apothecia are produced rarely and were not observed in the Caucasian material. At least initially delimited dark green soralia may resemble those of *Scoliciosporum sarothamni* or *Trapeliopsis flexuosa* but unlike those species contain argopsin (Pd+ red). Probably a widespread lichen in Russia.

Hazslinszkya gibberulosa (Ach.) Körb. – 1, 2, 3, 6, 7: AC, AN, AP, CB, FE, FO, QU, UG (GU1, JM3, JV5, ZP12).

Heterodermia japonica (M.Satô) Swinscow & Krog – 1, 2, 3, 4, 6, 7: AN, AT, FO, QU (GU5, IU2, JM1, JV4, ZP1).

Heterodermia speciosa (Wulfen) Trevis. – 1, 2, 4, 5, 7: AN, AP, AT, BL, CA, CB, FO, SA (GU3, IU7, JM2, ZP2).

Hyperphyscia adglutinata (Flörke) H.Mayrhofer & Poelt – 1, 2, 6, 7: AN/ne+tw (GU3, IU1, JM1, JV3, ZP2).

Hypocenomyce scalaris (Ach.) M.Choisy – 7: PK, snag (GU2).

Hypogymnia austerodes (Nyl.) Räsänen – 4, 5, 7: AN, AT, BL, FO, snag (GU1, IU3, JM2, JV1, ZP3).

Hypogymnia bitteri (Lynge) Ahti – 3, 4, 5: AN, AT, BL (GU1, IU1, ZP2).

Hypogymnia physodes (L.) Nyl. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CB, FO, PK, QU, RP, SA, SC, TB, Ti, log, snag, stump (GU17, IU13, JV1, ZP3).

Hypogymnia tubulosa (Schaer.) Hav. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, FO, PK, QU, RP, SA, SC, TB, snag, stump (GU13, IU12, ZP1).

Hypogymnia vittata (Ach.) Parrique – 3, 4, 5, 7: AN, BL, FO, SC (GU1, IU3, JM2, JV4, ZP1).

Hypotrachyna laevigata (Sm.) Hale – 1: AN/ne+tw (GU1).

Hypotrachyna revoluta (Flörke) Hale – 1, 2: AG, AN, FO, UG (GU3, IU2, JM1, JV2).

Icmadophila ericetorum (L.) Zahlbr. – 2, 4, 7: log (GU, IU, JM, JV, ZP – only field records).

Imshaugia aleurites (Ach.) S.L.F.Mey. – 7: AN, BL, PK, sang (IU1, JM1, JV2).

Inoderma byssaceum (Weigel) Gray – 1, 2, 3, 6: AN, AT, CB, FO, QU, snag (GU4, IU5, JM2, JV6, ZP4).

RC ***Japewia aliphatica*** Malíček, Palice, Tønsberg & Vondrák ined. – 7: BL (JV1). The species is characterized by its brown, often areolate thallus composed of tiny blastidia that frequently develop into soredia. An unknown fatty acid is produced as major secondary metabolite. It occurs in various types of montane forests in Europe, where it inhabits the acidic bark of broad-leaved trees (Malíček et al., unpublished).

Japewia subaurifera Muhr & Tønsberg – 5, 7: PK, SC, snag (GU1, IU1, JV1, ZP1). TLC: *Japewia* unknowns sensu Tønsberg (1992).

Japewia tornoënsis (Nyl.) Tønsberg – 7: AN, BL, PK, snag (GU2, JM1, JV3, ZP4).

Lathagrium auriforme (With.) Otálora, P.M.Jørg. & Wedin – 2, 7: QU, UG/bry (JV1, ZP1).

Lecania croatica (Zahlbr.) Kotlov – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, CA, CB, FO, QU, RP, SN, Ti, UG (GU7, IU12, JM5, JV10, ZP11). Lichen with a distinct green thallus around soralia, resembling *Mycobilimbia epixanthoides* (but usually growing directly on bark). Specimen JV16148 confirmed by ITS sequence data. The specimen ZP23048 is fertile.

Lecania cyrtella (Ach.) Th.Fr. – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CA, FO, JC, SA, UG, log, snag (GU10, IU5, JM4, JV8, ZP14).

Lecania cyrtellina (Nyl.) Sandst. – 1, 3, 4, 5, 7: AN, AT, FO, log, snag (GU7, IU2, JV1, ZP2).

Lecania naegelii (Hepp) Diederich & van den Boom – 1, 2, 3, 4, 6, 7: AG, AN, CA, CB, FO, LO, QU, Ti, UG, VO, snag (GU16, IU1, JV8, ZP6).

Lecanora albella (Pers.) Ach. – 2: CB (GU1, JM1, JV1).

Lecanora albellula (Nyl.) Th.Fr. – 2, 3, 4, 5, 7: AN, PK/wood, snag, stump (GU4, IU3, JM2, ZP3).

Lecanora allophana Nyl. – 2, 4, 5, 7: AN, AP, AT, FO, SA, UG (GU3, IU5, JM2, JV4, ZP6).

C ***Lecanora*** aff. ***anopta*** Nyl. – 7: AN/log (ZP1). TLC: usnic acid and an unknown related substance. Ascospores ellipsoid, 7–10 × 3–4.5 µm. Conidia cylindrical, slightly curved, c. 5–8 × 1 µm. The specimen ZP21226 recalls pale morps (green pigment deficient) of *L. anopta* by its finely pruinose, seemingly biatorine apothecia (early receding thalline margin is however visible on section), by unevenly inspersed guttulae (golden sclerotized ascospores) within the hymenium and by frequent pycnidia with slightly curved conidia (see Pérez-Ortega et al. 2010). The Caucasian specimen represents likely a separate species, distinct from *Lecanora anopta* due to its different chemistry and narrower ascospores.

Lecanora argentata (Ach.) Malme – 1, 2, 3, 4, 6, 7: AG, AN, AT, CB, FO, ST, Ti, UG (GU6, IU6, JM1, JV3, ZP7).

RC ***Lecanora barkmaniana*** Aptroot & van Herk – 1: UG/tw (JM1, ZP1). TLC: atranorin, zeorin. The specimen JM10602 was identified based on the match of ITS and mtSSU data following a BLASTN

search (100% identity and 76% coverage for ITS; >99% and 100% coverage for mtSSU). Both Caucasian specimens are sterile. This sorediate taxon was recently dealt with in more detail by Malíček et al. (2017).

Lecanora cadubriae (A.Massal.) Hedl. – 7: AN, PK (JV1, ZP1).

Lecanora carpinea (L.) Vain. – 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, QU, RP, SA, TB (GU22, IU11, JM6, JV1).

Lecanora chlarotera Nyl. – 2, 3, 4, 5, 6, 7: AN, AT, CA, CB, FO, SA (GU7, IU5, JM4, JV1, ZP2).

Lecanora cinereofusca H.Magn. – 1, 2, 6: CB, FO (JM2, JV2, ZP2).

NC ***Lecanora compallens*** Herk & Aptroot – 1, 4: AG, AN, Ti, snag (GU2, JV1, ZP1). TLC: usnic acid, zeorin. Sterile specimen ZP22341 is tentatively identified by its chemistry and delimited soralia (somewhat urceolate at the beginning). In Transcaucasia, this species has been recently reported from Armenia (Gasparyan et al. 2014).

Lecanora expallens Ach. – 1, 2, 3, 4, 5, 6, 7: AN, AG, CB, snag, stump (GU2, JM3, JV7, ZP2). Only sterile specimens recorded, often with a low concentration of xanthones.

Lecanora exspersa Nyl. – 3, 4, 5, 7: AN, AT, BL, FO, log, snag, stump (GU8, IU3, JM9, JV11, ZP17). TLC: atranorin, nephrosteranic acid or sometimes one additional fatty acid. Sequences from the Caucasian material were also used in the taxonomic work by Malíček et al. (2017).

Lecanora glabrata (Ach.) Malme – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, CA, CB, FO, QU, SA, ST, Ti (GU22, IU8, JM10, JV7, ZP10). Both chemotypes reported by Malíček (2014) were present in the study area.

Lecanora hypoptoides (Nyl.) Nyl. – 7: AN, snag (GU1, JV1).

Lecanora intumescens (Rebent.) Rabenh. – 1, 2, 3, 4, 5, 7: AT, BL, CA, FO, SA (GU8, IU7, JM2, JV7, ZP5).

Lecanora leptyrodes (Nyl.) Degel. – 2, 3, 4, 5, 7: AN, AP, AT, BL, FO, SA, SC (GU8, IU9, JM4, JV4).

Lecanora mughicola Nyl. – 7: AN/wood, PK/wood (ZP2). TLC: isousnic acid. Traces of *cinereorufa*-green pigment observed, broader ascospores than in *L. saligna* (4–5 µm).

C ***Lecanora phaeostigma*** (Körb.) Almb. – 4, 5, 7: AN/wood, PK/wood, log, snag (GU2, IU1, JM1, JV2, ZP2).

Lecanora praesistens Nyl. – 4, 5: AT, FO, SC (GU4, IU1, JM2). A member of the *Lecanora subfusca* group with 16-spored asci.

Lecanora pulicaris (Pers.) Ach. – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, FO, PK, SA, SC, ST, snag (GU3, IU7, JM4, JV3, ZP5). Very unusual morphotypes with a distinctly crenulate margin, which is not typical for this species, occured in the area. Additionally, the chemotype with fumarprotocetraric acid was missing; only atranorin and roccellic acid were recorded by TLC. Identity of several specimens was confirmed by the results of BLASTN searches based on ITS (>98% identity) and mtSSU (>99%) sequences.

Lecanora saligna (Schrad.) Zahlbr. – 3, 4, 5, 7: AT, FO, SC, snag (GU1, IU1, JM2, JV2, ZP1).

NC ***Lecanora sarcopidoides*** (A.Massal.) A.L.Sm. – 4: AN/snag (ZP1). TLC: pseudoplacodiolic acid. Microconidia (often gently bent) 4–5 × 0.8 µm. In Transcaucasia, this species has been reported from Abkhazia and Azerbaijan (Barkhalov 1983).

Lecanora stanislai Guz.-Krzem., Łubek, Malíček & Kukwa – 1, 2: AG, FO (JM4, JV1). TLC: zeorin, usnic acid. Recently described species similar to *L. expallens*, but without xanthones (Guzow-Krzemińska et al. 2017). Two Caucasian specimens (JM10367, JV14920) are paratypes. It differs

from *L. compallens* by expanding soralia (not delimited like in typical *L. compallens*). Identifications were confirmed by M. Kukwa.

Lecanora subcarpinea Szatala – 3, 5: AT, BL, FO (GU3, IU1).

Lecanora subintricata (Nyl.) Th.Fr. – 7: snag (IU1, JM1, JV1, ZP2).

RC ***Lecanora subravida*** Nyl. – 1, 2: snag (JM1, ZP1). TLC: usnic, isousnic, pseudoplacodiolic and squamatic acids. Macroconidia broadly falcate, 9–10 × 3–3.3 µm. The taxon of the *Lecanora saligna* group seems to prefer old-growth forest habitats, as indicated by a few so far known published, often historical localities (VAN DEN BOOM & BRAND 2008).

Lecanora symmicta (Ach.) Ach. – 1, 2, 5, 6, 7: AT, BL, FO, QU, Ti, UG, snag (GU4, IU2, JM3, JV1, ZP2).

Lecanora thysanophora R.C.Harris – 1, 2, 3, 4, 5, 6: AG, AN, AP, AT, BL, CA, CB, FO, QU, SC, Ti (GU8, IU3, JM3, JV4, ZP1). TLC: atranorin (trace), usnic acid, zeorin, thysanophora unknowns.

Lecidea albofuscescens Nyl. – 7: AN, SA (JV1, ZP1).

C ***Lecidea apochroeella*** Nyl. – 1: wood (JM1). Hypothecium brown (K-); epihymenium granular, brownish; exciple colourless, thick; apothecial section: K-, C-; ascospores simple, c. 10–12 × 3–4 µm.

Lecidea coriacea Holien & Palice – 3, 7: AN/wood, log (JM1, JV1, ZP5). This old-growth forest species related to *Lecidea betulicola* is easily identifiable due to the content of secalonic acid A in hypothecium (KOH + golden-yellow). It was described quite recently (HOLIEN et al. 2016) and some of our specimens are paratypes.

Lecidea nylanderi (Anzi) Th.Fr. – 1, 7: FO, PK, snag (GU1, IU1, JM2, JV2, ZP2).

NC ***Lecidea sphaerella*** Hedl. – 2, 3, 4, 7: AN, AT, BL, FO, UG (JM2, JV5, ZP2). In Transcaucasia, this species has been reported from Georgia (BARKHALOV 1983).

RC ***Lecidea strasseri*** Zahlbr. – 2: QU/bry (JV1). Similar to *Bryobilimbia sanguineoatra*, but with a granular thallus and distinctly thickened paraphyse tips. It is closely related to the alpine *Lecidea berengeriana*, but it typically grows at bases of trunks of old oaks in warmer habitats.

Lecidella achristotera (Nyl.) Hertel & Leuckert – 2, 3, 4: AN, AT, FO, stump (GU7, IU1).

Lecidella elaeochroma (Ach.) M.Choisy s. lat. – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, QU, RP, SA, SC, Ti, UG, snag (GU9, IU5, JM2, JV21, ZP22).

Lecidella euphorea (Flörke) Hertel – 1, 2, 5, 7: AN, AT, BL, CB, FO, SA, SC, log (GU7, IU11).

Lecidella flavosorediata (Vězda) Hertel & Leuckert – 2, 3, 4, 6, 7: AN, AT, BL, FO, RP, SA, snag (GU2, IU2, JM6, JV5, ZP7). TLC: granulosin, arthothelin, +1 additional xanthone with lower Rf value. Identification of JM11114 confirmed by ITS and mtSSU.

Lecidella laureri (Hepp) Körb. – 2, 3, 4, 6, 7: AN, AP, FO, TB (GU7, IU2, ZP1).

Lepra albescens (Huds.) Hafellner – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, QU, RP, SA, Ti, UG (GU12, IU8, JV6).

Lepra amara (Ach.) Hafellner – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, QU, RP, SA, SC, TB, Ti, log (GU11, IU20, JV4, ZP2).

C ***Lepra borealis*** (Erichsen) I.Schmitt, Hodkinson & Lumbsch – 2: AN, FO (JM2). TLC: protocetraric/fumarprotocetraric acid (in solvents A & C). Both samples correspond also morphologically with *L. borealis*.

Lepra ophthalmiza (Nyl.) Hafellner – 2, 3: AN, FO, ST (JM2, JV2, ZP1). TLC: unidentified aliphatic compounds.

Lepra trachythallina (Erichsen) Lendemer & R.C.Harris – 1, 2, 6: CB, FO, QU, Ti (GU5, IU3, JM3, JV6, ZP3). TLC: thamnolic acid.

Lepra waghornei (Hult.) Lendemer & R.C.Harris – 1, 2: CB, FO (GU1, JM1, ZP3). TLC: norstictic acid.

Lepraria eburnea J.R.Laundon – 2: CB/bry, QU/bry (GU2, IU1, ZP2). TLC: chemotype I – alectorialic and protocetraric acids; chemotype II – alectorialic, barbatolic, psoromic and 2'-O-demethylpsoromic acids.

Lepraria elobata Tønsberg – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, FO, UG, log (GU2, IU6, JM3, JV4, ZP1). TLC: stictic, constictic acids, zeorin, atranorin.

Lepraria finkii (B.de Lesd.) R.C. Harris – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, BL, CB, FO, QU, RP, Ti, UG, snag (GU28, IU4, JV19, ZP7). TLC: stictic, constictic acids, zeorin, atranorin.

Lepraria incana (L.) Ach. – 1, 2, 3, 4, 6, 7: AG, AN, AT, BL, FO, QU, snag (GU2, IU1, JM4, JV10, ZP4). TLC: divaricatic acid, zeorin. Some morphologically typical specimens checked additionally by UV+ white reaction.

Lepraria jackii Tønsberg – 1, 3, 4, 5, 6, 7: AN, snag, stump (GU3, JM1, ZP1). TLC: atranorin, jackinic and roccellic acids.

Lepraria rigidula (B.de Lesd.) Tønsberg – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, CB, FO, PK, QU, RP, SA, snag/bry (GU3, IU2, JM2, JV5, ZP4). TLC: atranorin, nephrosteranic acid.

Lepraria vouauxii (Hue) R.C.Harris – 1, 2, 3, 4, 6: AP, AT, CB, FO, Ti (JM2, JV3, ZP4). TLC: pannaric acid 6-methylester.

Leptogium burnetiae C.W.Dodge – 1, 2, 3, 4, 6, 7: AN, AP, AT, CA, FE, FO, QU, SA, Ti, UG (GU6, IU8, JM4, JV4, ZP5). MtSSU sequence of JV15904 has 99% identity with *L. burnetiae* from Spain and with *L. pedicellatum* from Korea. Our samples match the description of *L. burnetiae*: tomentum on the lower thallus surface of cylindrical cells, isidia coralloid forming patchy clusters on the upper surface; thallus colour blue-grey. A red-listed species in the Russian Federation (Trutnev et al. 2008).

Leptogium cyanescens (Rabenh.) Körb. – 1, 2, 6: AN, AT, CA, CB, FE, FO, QU, RP, SN, Ti, UG, log (GU7, IU9, JM4, JV4, ZP5).

RC ***Leptogium hibernicum*** M.E.Mitch. ex P.M.Jørg. – 2: Ti (IU1). Upper surface transversely wrinkled-striate with nodular isidia; lower surface uniformly finely pubescent-tomentose; tomental hairs c. 15–20 µm long with globose cells.

Leptogium saturninum (Dicks.) Nyl. – 1, 2, 3, 4, 5, 6, 7: AP, AT, BL, CA, FO, SA, SC, SN, QU, UG/bry (GU1, IU9, JM5, JV8, ZP5). Specimen JV15903 was confirmed by a mtSSU sequence (similarity 99–100% with *L. saturninum* according to Blast).

Letharia vulpina (L.) Hue – 7: PK/wood, snag (GU & IU (photodocumentation), JM, JV, ZP – field records). A red-listed species in the Russian Federation (Trutnev et al. 2008).

Lichenomphalia umbellifera (L.: Fr.) Redhead, Lutzoni, Moncalvo & Vilgalyis – 2, 3, 7: log, stump (IU3, JV1).

RC ***Lithothelium hyalosporum*** (Nyl.) Aptroot – 1, 2, 6: AN, CB, FO (GU1, IU4, JM1, JV1, ZP3). Our specimens have ascospores usually 20–28 µm long. Aptroot (2006) reported ascospores 14–20(–24) µm long. This is the first report of the genus for Russia and Caucasus.

RC ***Lithothelium phaeosporum*** (R.C.Harris) Aptroot – 1: FO (IU1). This species is closely related to *L. septemseptatum*, but has only 3 instead of 5–7 septa (Aptroot 2006).

RC ***Lithothelium septemseptatum*** (R.C.Harris) Aptroot – 1: QU (ZP1). Perithecia with reddish-brown pigment in the perithecial wall, completely immersed in the bark. Trentepohlioid photobiont present. Mature ascospores usually 6-celled, getting red-brown, c. 38 × 13.5 µm.

Lobaria pulmonaria (L.) Hoffm. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CA, CB, FO, QU, RP, SA, Ti, UG, log (GU12, IU14, JV1, ZP1). A red-listed species in the Russian Federation (Trutnev et al. 2008).

Lobarina scrobiculata (Scop.) Nyl. ex Cromb. – 1, 2, 3, 4, 5, 6, 7: AN, BL, FO, QU, RP, SA, SC (GU2, IU5, JM3, ZP3).

C ***Lopadium disciforme*** (Flot.) Kullh. – 1, 3, 4, 6, 7: AN, AT, BL, FO, QU, snag (GU2, IU1, JM3, JV1, ZP2).

RC ***Loxospora cristinae*** Guz.-Krzem., Łubek, Kubiak & Kukwa – 1, 2, 6: AN, FO, RP (JM4, JV6, ZP4). Identification of this recently described species has been confirmed by TLC – the samples contained 2'-O-methylperlatolic acid with traces of (up to four) related compounds. Several samples were also sequenced (ITS and mtSSU). Except the Caucasus the species is known from Poland, Germany and Switzerland (Guzow-Krzemińska et al. 2018, Wirth et al. 2018, Dietrich & Malíček 2019).

NC ***Loxospora elatina*** (Ach.) A.Massal. – 1, 2, 3, 6, 7: AG, AN, AT, FO, PK, QU (GU3, JM5, JV7, ZP4). In Transcaucasia, this species has been reported from Abkhazia and Azerbaijan (Barkhalov 1983).

Marchantiana asserigena (J.Lahm) Søchting & Arup – 1, 2: UG/tw, FO/tw (IU1, JV1). Specimen JV16394 confirmed with ITS sequence data.

Maronea constans (Nyl.) Hepp – 1, 2, 6: AN, FO, RP (GU2, JM2, JV2, ZP5).

Megalaria grossa (Pers. ex Nyl.) Hafellner – 1, 2: AN, QU (JM2, ZP1).

Megalaria laureri (Th. Fr.) Hafellner – 1, 2, 3, 6: AN, AP, CB, FO, QU, RP, ST, Ti (GU12, IU1, JM4, JV6, ZP12).

C ***Megalospora porphyritis*** (Tuck.) R.C.Harris – 1: FO (JV1). MtSSU of a sterile, sorediate specimen JV15146 (TLC: pannarin, zeorin), matches 99% the Australian sample Kantvilas 370/09 of *Megalospora tuberculosa*). It should be noted, the authors of the phylogenetic study, where this sample was included (Kantvilas & Lumbsch 2012), followed a broad concept of the species by Sipman (1983, 1986) who included pannarin-containing North American *M. porphyritis* (Sipman 1983) and later, also non-sorediate Australian *M. inflexa* (Sipman 1986) under *M. tuberculosa*, as 'chemical strain B'. The same authors (Kantvilas & Lumbsch 2012) have shown that *M. tuberculosa* (sensu Sipman) is non-monophyletic taxon, but left the question of the species circumscription open. *M. porphyritis* has recently been reported as new to Russia as an example of "American/Asian disjunction" (Ezhkin 2018). It should be kept in mind that the pannarin strain of *M. tuberculosa* sensu Sipman (1983, 1986) shows much larger distribution including S Brazil and Australia. More detailed studies with larger sampling are necessary to resolve species boundaries in this complex.

RNC ***Melanelixia epilosa*** (J.Steiner) A.Crespo et al. – 3, 4, 5, 7: AN, AT, BL, FO, SA, SC, UG (GU8, IU10, JM3, JV3, ZP2). We sequenced one specimen (ITS and mtSSU) and confirmed *M. epilosa* (>99% for ITS). The presence of *M. glabra* among non-sequenced specimens remains possible. In Transcaucasia, *M. epilosa* has been recently reported from Armenia and Georgia (Leavitt et al. 2016).

Melanelixia glabratula (Lamy) Sandler & Arup – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, RP, SA, Ti, log, snag (GU10, IU7, ZP1).

Melanelixia subargentifera (Nyl.) O.Blanco et al. – 3, 4, 6: AT, CB, FO (GU2, JM1).

Melanelixia subaurifera (Nyl.) O.Blanco et al. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, BL, CB, FE, FO, QU, RP, TB, Ti, log, snag (GU30, IU10, ZP2).

Melanohalea exasperata (De Not.) O.Blanco et al. – 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, SA, SC, UG (GU12, IU6, JV4, ZP4).

Melanohalea exasperatula (Nyl.) O.Blanco et al. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CB, FO, RP, SA, SC, TB, snag (GU22, IU12, JV2, ZP4).

Menegazzia subsimilis (H. Magn.) R.Sant. – 1, 2, 3, 6: AG, CB, FO (GU1, JM1, JV3, ZP1).

Menegazzia terebrata (Hoffm.) A.Massal. – 1, 2, 4, 5, 6: AG, AN, CB, BL, FO, QU (GU3, IU1, JM2).

C ***Micarea anterior*** (Nyl.) Hedl. – 7: AN/snag (ZP1).

C ***Micarea botryoides*** (Nyl.) Coppins – 1, 4, 6, 7: log, snag (JV3, ZP2).

Micarea denigrata (Fr.) Hedl. – 3, 4, 5, 7: log, snag, stump (GU3, JM5, JV5, ZP7). TLC: gyrophoric and 5-O-methylhiascic acids.

C ***Micarea elachista*** (Körb.) Coppins & R.Sant. – 7: PK/snag (JV1, ZP1).

Micarea globulosella (Nyl.) Coppins – 1, 3, 4, 5: AN, BL, FO (GU2, IU2, JM2, JV4, ZP2). TLC and spot tests: gyrophoric acid not detected in most specimens. Possibly *M. synotheoides* is involved here too; the specimen ZP21248 shows faintly C+ reddish reaction.

C ***Micarea hedlundii*** Coppins – 2, 7: log (JM1, JV1).

Micarea melaena (Nyl.) Hedl. – 1, 7: AN, PK/wood, QU/snag, stump (IU2, JM2, JV2, ZP1).

C ***Micarea melaeniza*** Hedl. – 2, 3: AN/wood, snag (IU3, ZP2).

Micarea micrococca (Körb.) Gams ex Coppins – 1, 2, 3, 4, 5, 6, 7: AG, AN/wood, CB/wood, QU/wood, log, snag, stump (GU5, IU10, JV10, ZP6).

Micarea misella (Nyl.) Hedl. – 1, 2, 3, 4, 5, 7: log, snag, stump (GU1, IU1, JM4, JV10, ZP8).

Micarea nigella Coppins – 1, 3, 4, 7: BL/wood root, log, snag, stump (GU3, JM1, JV5, ZP2). Pycnidia often do not contain any traces of purple (K+ green) pigment (character of *M. melaeniza*), but the pigment is always present in the hypothecium.

RC ***Micarea nowakii*** Czarnota & Coppins – 4, 5, 7: wood (JM3). TLC: micareic acid. Identity confirmed by mtSSU barcoding (97–99 % in BLASTN search).

Micarea peliocarpa (Anzi) Coppins & R.Sant. – 1, 2, 3, 4, 5, 6, 7: AG, AN, CB/wood, FO, log, snag, stump (GU5, IU3, JM2, JV8, ZP4).

RC ***Micarea perparvula*** (Nyl.) Coppins & Printzen – 3: log (JM1). The voucher corresponds well to a sample from Italy (JM6933) identified by B. Coppins.

Micarea prasina Fr. – 1, 2, 3, 4, 5, 7: AN, BL, QU, log, snag, stump (GU6, IU2, JM8, JV6, ZP7).

Micarea pusilla Launis, Malíček & Myllys – 2, 3, 6: log (JM1, ZP3). This is a recently described species from the *M. micrococca* group, characterized by very small (up to 0.2 mm in diam.) whitish apothecia, usually very thin and membranaceous thallus and small ascospores (7–9 × 2–3 µm). It occurs especially on wood of coniferous trees (mainly stumps of *Picea abies*) in old-growth as well as managed forests (Launis et al. 2019).

Micarea soralifera Guz.-Krzem., Czarnota, Łubek & Kukwa – 1, 2, 3, 4, 5, 6, 7: AN, BL, FO, QU, log, snag, stump (GU7, IU6, JV12). TLC: micareic acid. This newly described species is characterized by the thallus developing distinct, mostly delimited green soralia, the presence of micareic acid and the *Sedifolia*-grey pigment in darker apothecia and soredia (Guzow-Krzemińska et al. 2016). *M. soralifera* can be confused in the field with several other sorediate *Micarea* species and *Trapelia corticola*, which is very common and often grows in the same localities as *M. soralifera*. *T. corticola*, however, contains gyrophoric acid (soralia and thallus C+ red). Most specimens are sterile with at least initially clearly delimited, dark green soralia, producing fine soredia.

C ***Micarea tomentosa*** Czarnota & Coppins – 2, 7: AN/snag (JV1, ZP1).

Multiclavula mucida (Pers.) R.H.Petersen – 6, 7: log (GU1).

Mycobilimbia carneoalbida (Müll. Arg.) S.Ekman & Printzen – 4, 7: FO/bry, UG/bry (GU1, JM1, JV4, ZP1).

Mycobilimbia epixanthoides (Nyl.) Vitik., Ahti, Kuusinen, Lommi & T.Ulvinen ex Hafellner & Türk – 1, 2, 3, 4, 5, 6, 7: AN, AT/bry, BL, CB, FO/bry, QU/bry, RP, Ti/bry, UG/bry (IU1, JM7, JV4, ZP8). Thallus similar to well developed *Lecania croatica*, but the latter species rarely spreads from bark to bryophytes. The sterile specimen JV16494 (partly on bark, partly on epiphytic bryophytes) is confirmed as *M. epixanthoides* with ITS and mtSSU data (99 % similarities with available *M. epixanthoides* sequences in GenBank).

Mycobilimbia tetramera (De Not.) Vitik., Ahti, Kuusinen, Lommi & T.Ulvinen ex Hafellner & Türk – 4, 5, 7: AT/bry, UG/bry, log/bry (IU1, JM3, JV4).

C ***Mycoblastus alpinus*** (Fr.) Th.Fr. ex Hellb. – 7: AN/log, snag (JV1, ZP1). TLC: atranorin, usnic acid, cf. planaic acid. This sorediate taxon is dealt as synonym under its fertile counterpart *Mycoblastus affinis* (Schaer.) T.Schauer by Nimis et al. (2018). Here we follow the traditional concept to separate these two distinctive morpho-ecotypes as distinct species.

Myelochroa aurulenta (Tuck.) Elix & Hale – 1: FO (ZP1). TLC: atranorin, 4–5 terpenoids incl. zeorin and leucotylic acid, cf. secalonic acid A. Spot reaction of medulla Pd-.

Myelochroa metarevoluta (Asahina) Elix & Hale – 1: AN/ne+tw, AT, CA, FO (GU3, ZP1). TLC: atranorin, galbinic acid, 3–4 major terpenoids (zeorin, leucocytin, leucocytic acid and derivatives), cf. salazinic acid. Spot reaction of medulla Pd+ orange.

Myriolecis persimilis (Th.Fr.) Śliwa, Zhao Xin & Lumbsch – 2, 3, 4, 5, 7: AN, AT, AP, BL, CB, FO, SA, TB, UG (GU10, IU5, JM2, JV6, ZP8).

Myriolecis sambuci (Pers.) Clem. – 4, 7: AT, FO (GU1, IU1, JM2, JV2, ZP1).

Nephroma bellum (Spreng.) Tuck. – 2, 4, 5, 7: AN, AT, BL, CB, FO, SA, SC, log (GU1, IU4, JM2, JV3, ZP3).

Nephroma helveticum Ach. – 2: FO, RP (GU1, JV1).

Nephroma parile (Ach.) Ach. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CB, FO, QU, RP, SA, SC, ST, UG, log (GU11, IU17, JM2, JV3, ZP5).

Nephroma resupinatum (L.) Ach. – 2, 3, 4, 5, 7: AP, AT, BL, FO, SA, SC, UG (GU2, IU6, JV3, ZP2).

C ***Normandina acroglypta*** (Norman) Aptroot – 1, 2, 3, 4, 5, 6, 7: AN, BL, CB, FO, QU, SA – often associated with bryophytes (GU1, JM1, JV4, ZP9). The species is easily overlooked for other sorediate crustose lichens when without perithecia. Collected Caucasian material is sterile with greenish areolate-subsquamulose thalli, usually producing rich soralia, often covering liverworts/bryophytes on bark of deciduous trees. TLC of the specimen ZP22076 revealed presence of zeorin, which was previously discovered by Tønsberg (see Norvegian Lichen Database) and also reported by Malíček et al. (2014) for this species. The presence of zeorin clearly separates strongly sorediate morphs of *N. acroglypta* from *Mycobilimbia epixanthoides*, a species with a similar appearance and ecology.

Normandina pulchella (Borrer) Nyl. – 1, 2, 4, 6: AC, AG, AN, AT, BL, CA, CB, FO, QU, RP, UG – often associated with liverworts (GU3, IU3, JM2, JV1, ZP2).

Ochrolechia alboflavescens (Wulfen) Zahlbr. – 4, 5, 7: AN, BL, PK (GU2, IU1, JM3, JV3, ZP3). TLC: variolaric acid, lichesterinic, protolichesterinic acids. A richly fertile specimen (ZP22813) contained atranorin and gyrophoric acid in addition.

Ochrolechia androgyna (Hoffm.) Arnold – 1, 3, 6, 7: AN, AT, BL, FO, TB (GU1, JM1, JV3, ZP3). TLC: gyrophoric and lecanoric acids, androgyna B (1–3) unknowns.

Ochrolechia arborea (Kreyer) Almb. – 1, 2, 5, 7: AN/snag with bark, BL, CB, FO, PK, RP, SA, UG, snag (GU1, IU1, JM4, JV4, ZP4). TLC: gyrophoric and lecanoric acids, lichexanthone. UV+ orange.

Ochrolechia bahusiensis H.Magn. – 1, 2, 3, 4, 3, 7: AN, AT, BL, CB, FO, RP, SA, snag (IU1, JM4, JV1, ZP11). TLC: lecanoric and gyrophoric acids, murolic acid complex. UV+ white thallus.

C ***Ochrolechia mahluensis*** Räsänen – 3, 4: AT (JM2, JV1). TLC: gyrophoric and lecanoric acids.

Ochrolechia microstictoides Räsänen – 2, 4, 5, 7: AN, BL, CB/wood, PK, log, snag (GU1, IU1, JM4, JV1, ZP3). TLC: only variolaric acid. K-, P+ yellow, C+ yellow, UV+ white.

Ochrolechia pallescens (L.) A.Massal. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, BL, CB, FO, RP, SA, SC, UG, stump (GU12, IU8, JM4, JV4, ZP13). TLC: variolaric acid, murolic acid, gyrophoric acid. One specimen collected by JM confirmed by ITS and mtSSU.

Ochrolechia szatalaensis Verseghy – 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, RP, SA, snag (GU5, IU3, JM1, JV3, ZP3). TLC: variolaric acid.

Ochrolechia trochophora (Vain.) Oshio – 1, 6: CB, FO (JM1, JV2, ZP3). TLC: gyrophoric and lecanoric acids. Identification of the specimen JV15442 was confirmed by mtSSU and ITS barcode.

Ochrolechia turneri (Sm.) Hasselrot – 2, 4, 7: AN, QU, snag (IU1, ZP2).

Opegrapha niveoatra (Borrer) J.R.Laundon – 1, 2, 3, 4, 6, 7: AG, AN, AT, FO, PK/wood, Ti, snag (GU8, IU7, JM3, JV8, ZP8).

RC ***Opegrapha trochodes*** Coppins, F.Berger & Ertz – 1, 2, 3, 4, 6, 7: AN, AT, CB, FO, QU, UG (GU1, IU3, JM3, JV3, ZP7).

Opegrapha vermicellifera (Kunze) J.R.Laundon – 1, 2, 3, 4, 6: AN, AT, CB, FO, QU, Ti (GU3, IU2, JM3, JV5, ZP3).

RC ***Orcularia insperata*** (Nyl.) Kalb & Giralt – 2: AN/tw (ZP1). The genus *Orcularia* has recently been segregated from the artificial genera *Buellia* and *Rinodina* (Kalb & Giralt 2011) based on polarilocular ascospores (*Orcularia*-type) and filiform conidia (like in the genus *Amandinea*). *Orcularia insperata* is the most widespread species of the genus, known from temperate to tropical regions in both hemispheres. In Europe the epithet *biloculata* (either as *Buellia* or *Rinodina*) was used for this species, which shows an oceanic-Mediterranean distribution (Giavarini et al. 2009). The Caucasian specimen is rather small, with apothecia superficially resembling *Catillaria nigroclavata*, but containing characteristic, only slightly pigmented brownish polarilocular ascospores fitting the description in Kalb & Giralt (2011). This is the first report of the genus for Russia and Caucasus.

Pannaria conoplea (Ach.) Bory – 1, 2, 3, 4, 5, 7: AN, AP, AT, BL, CB, FO, QU, RP, SA, SC, UG (GU3, IU3, JM4, JV4, ZP2).

Parmelia barrenoae Divakar, M.C.Molina & A.Crespo – 4, 5: BL, FO (JM1, ZP1).

Parmelia ernstiae Feuerer & A.Thell – 1, 2, 3, 4, 5, 6, 7: AN, AT, FO, QU, RP, SA (GU9, IU9, JM3, ZP6).

Parmelia saxatilis (L.) Ach. – 2, 3, 4, 5, 7: AN, AT, BL, FO, PK, QU, SA, TB, log, snag (GU4, IU8). Some specimens resembling *P. ernstiae* by a strongly pruinose thallus upper surface, but confirmed as *P. saxatilis* by ITS sequences.

Parmelia serrana A.Crespo, M.C.Molina & D.Hawksw. – 4, 5, 7: AT, BL, FO (JM3). Confirmed by ITS and mtSSU.

Parmelia submontana Nádv. ex Hale – 2, 3, 4, 5, 7: AN, AT, BL, FO, QU, RP, SA, SC, TB, UG (GU1, IU3, JM2, ZP1).

Parmelia sulcata Taylor – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CB, FO, PK, QU, RP, SA, SC, TB, Ti, log, snag, stump (GU41, IU26, JM1, ZP2).

Parmeliella triptophylla (Ach.) Müll.Arg. – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, CA, FE, FO, QU, RP, SA, Ti, UG (GU13, IU12, JM1, JV8, ZP7).

Parmelina carporrhizans (Taylor) Poelt & Vězda – 1, 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, SA, Ti (GU4, IU5, JV5, ZP5).

Parmelina pastillifera (Harm.) Hale – 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, RP, UG (GU4, IU3, JV1, ZP1).

Parmelina quercina (Willd.) Hale – 3, 4, 5, 6, 7: AN, AT, BL, Ti (GU1, JV1, JM2).

Parmeliopsis ambigua (Wulfen) Nyl. – 3, 4, 5, 6, 7: AN, AP, AT, BL, FO, PK, log, snag, stump (GU9, IU11, JV1).

Parmeliopsis hyperopta (Ach.) Arnold – 3, 4, 5, 7: AN, BL, FO, PK, log, snag (GU1, IU4, ZP1).

Parmotrema perlatum (Huds.) M.Choisy – 1, 2, 6: AG, AN, CB, FO, RP, SN, UG (GU5, IU4, JM4, JV1, ZP3). TLC: stictic acid complex, atranorin.

RC ***Parvoplaca servitiana*** (Szatala) Arup, Søchting & Frödén – 3, 4: AN/tw (IU1, JV1). Specimen JV16132 confirmed with ITS sequence data.

Parvoplaca tiroliensis (Zahlbr.) Arup, Søchting & Frödén – 7: UG/bry (GU1, JV1). Tiny yellow apothecia were recorded on bryophytes covering trunk of *Ulmus glabra* (not its typical ecology). Specimen JV15751 confirmed with ITS and mtSSU sequence data.

Peltigera collina (Ach.) Schrad. – 1, 2, 3, 4, 6, 7: AG, AN, AP, AT, CB, FO, QU, RP, SA, Ti, UG, log (GU4, IU7, JM2, JV1, ZP1).

Peltigera degenii Gyeln. – 2, 3, 4, 5, 7: AN, FO, log, snag (GU1, IU5, JM1, JV2).

Peltigera horizontalis (Huds.) Baumg. – 1, 2, 3, 6, 7: AN, AT, FO, QU, SA, log, snag (GU1, IU2).

Peltigera neopolydactyla (Gyeln.) Gyeln. – 2, 6: log, snag (IU1, ZP1).

Peltigera polydactylon (Neck.) Hoffm. – 2, 3, 4, 5, 6, 7: AN, BL, FO, SC, log, snag (GU1, IU2, JM1, JV3).

Peltigera praetextata (Flörke ex Sommerf.) Zopf – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, QU, RP, SA, UG, log, snag (GU5, IU10, JV2, ZP2).

Pertusaria coccodes (Ach.) Nyl. – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, ST, log, snag (GU5, IU2, JM2, JV4, ZP7).

Pertusaria constricta Erichsen – 1, 2, 3, 4, 6, 7: AN, AP, AT, CA, CB, FO, SA (GU6, IU2, JM4, JV4, ZP3).

Pertusaria coronata (Ach.) Th.Fr. – 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, PK/wood, QU, SA, Ti, snag (GU13, IU11, JM4, JV3, ZP6).

Pertusaria flavida (DC.) J.R.Laundon – 2, 3, 4, 6, 7: AN, AT, BL, FO, Ti (GU1, IU1, JM1, JV1, ZP2). TLC: thiophaninic and an additional xanthone.

Pertusaria leioplaca DC. – 1, 2, 3, 4, 6, 7: AN, AT, CA, CB, FO, RP, SA, UG (GU9, IU2, JM3, JV8, ZP6). TLC: stictic acid, coronatone. A variable material that may comprise more taxa; while material from the montane plot 7 displays distinctly convex ascocarps with 4–6-spored asci, the specimen from the 'lowland' plot 1 (ZP23406) has shallow ascocarps and 6–8 spored asci recalling *'Pertusaria alpina'*.

Pertusaria pertusa (Weigel) Tuck. – 1, 2, 6: AN, AP, CB, FO, ST, Ti (GU5, IU1, JM1, JV2, ZP3).

C ***Pertusaria pupillaris*** (Nyl.) Th.Fr. – 3, 4, 5, 7: AN, BL, snag (JM1, JV5, ZP3). TLC: protocetraric acid or fumarprotocetraric acid (ZP22074).

Pertusaria sommerfeltii (Flörke ex Sommerf.) Fr. – 4, 6, 7: AN, AT, FO, snag (GU2, IU1, JV2, ZP7).

Phaeophyscia ciliata (Hoffm.) Moberg – 1: SN (GU1).

Phaeophyscia endophoenicea (Harm.) Moberg – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, FO, UG (GU6, IU9, JM3, JV3, ZP3).

Phaeophyscia orbicularis (Neck.) Moberg – 4, 5, 7: AT, FO, LO, UG (GU1, IU2, JV2, ZP2).

Phaeophyscia pusilloides (Zahlbr.) Essl. – 1, 6: AC, AG, AN, CA, CB, FO, SN, Ti, UG (GU12, IU9, JM2, JV4, ZP5).

Phaeophyscia rubropulchra (Degel.) Essl. – 1, 2, 3, 6: AG, AN, AT, CB, FO (GU2, IU1, JM2, JV2, ZP3).

Phlyctis agelaea (Ach.) Flot. – 1, 2, 3, 6: AN, AT, CA, CB, FO, QU, RP, Ti (GU3, IU4, JM2, JV4, ZP2).

Phlyctis argena (Spreng.) Flot. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CB, FO, QU, TB, Ti, UG, snag (GU17, IU8, JM1, JV2, ZP1).

RC ***Phylloblastia inexpectata*** Sérus., Coppins & Lücking – 2: RP/le (IU1, JM1). The specimens fully correspond to the description of this species by Sérusiaux et al. (2007). This is the first report of the genus for Russia and Caucasus.

Phyllogyalidea phyllophila (Vězda) Lücking & Aptroot – 1, 6: AN/ne (GU3, ZP2).

Physcia adscendens (Fr.) H.Olivier – 1, 3, 4, 6, 7: AG, AN, AP, AT, FO (GU9, IU9, JM1, JV2, ZP1).

Physcia aipolia (Ehrh. ex Humb.) Fürnr. – 1, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CA, CB, FO, SA, SC, Ti, UG (GU6, IU9, JM2, JV2, ZP6).

Physcia cf. ***biziana*** (A.Massal.) Zahlbr. – 5: BL (JM1). A single small thallus fits well with a description of this species (e.g. Atanassova & Mayrhofer 2012), but according to BLASTN, our sample of *P. biziana* has not been placed close to sequences of this species in the GenBank database (AF224417, GU247178, GU247212).

Physcia stellaris (L.) Nyl. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, FO, SA, SC, UG (GU13, IU5, JV4, ZP4).

Physcia tenella (Scop.) DC. – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, RP, SA, TB, Ti, UG (GU14, IU8, JV1, ZP1).

Physcia tribacia (Ach.) Nyl. – 4: AT (IU1, JM1).

Physciella chloantha (Ach.) Essl. – 1, 6: AC, AG, AN, CA, CB, FO, SN, UG (GU3, IU2, ZP2).

Physconia detersa (Nyl.) Poelt – 3, 4, 6: AT, FO (JV2, ZP3).

Physconia distorta (With.) J.R.Laundon – 1, 2, 3, 4, 5, 6, 7: AC, AN, AP, AT, BL, CA, CB, FE, FO, SA, SC, Ti, UG (GU18, IU25, JM2, JV3, ZP3).

Physconia perisidiosa (Erichsen) Moberg – 3, 4, 5, 7: AN, AP, AT, FO, UG (GU2, IU6, JM3, JV1, ZP1).

NC ***Piccolia ochrophora*** (Nyl.) Hafellner – 1, 2, 4: AT, QU, SN (JM1, JV2). Specimen JV14926 represents an anamorph with distinct white pycnidia and sphaerical conidia. In Transcaucasia, this species has been recently reported from Armenia (Gasparyan et al. 2015).

Placynthiella dasaea (Stirt.) Tønsberg – 2, 3, 4, 5, 7: AN/wood, FO/wood, log, snag, stump (GU5, IU3, JM2, JV2, ZP5).

Placynthiella icmalea (Ach.) Coppins & P.James – 1, 2, 3, 4, 5, 7: AN, BL, CB/wood, FO, PK/wood, log, snag, stump (GU9, IU10, JV3, ZP4).

Platismatia glauca (L.) W.L.Culb. & C.F.Culb. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, BL, FO, PK, SA, TB, snag (GU5, IU5, JV1).

Polycauliona candelaria (L.) Frödén, Arup & Søchting – 7: AN (ZP1).

Polycauliona polycarpa (Hoffm.) Frödén, Arup & Søchting – 7: UG (JV1).

Porina aenea (Wallr.) Zahlbr. – 1, 2, 3, 4, 6, 7: AN, AP, AT, CB, FO, QU, RP, SA, log (GU16, IU3, JM3, JV8, ZP6).

Porina borreri (Trevis.) D.Hawksw. & P.James – 1: CB (GU1).

Porina byssophila (Körb. ex Hepp) Zahlbr. – 2, 3: CB, FO (ZP2). Similar to *P. aenea* but with a different pigmentation, giving a KOH+ greyish blue reaction. Identity of the specimen ZP24020 confirmed by A. Orange. Previously it was recorded only once from the Caucasus as a saxicolous species (URBANAVICHUS & URBANAVICHENE 2004). Recently it has been shown it is more frequent species than previously believed and often growing as an epiphyte as well (POWELL 2013).

Porina leptalea (Durieu & Mont.) A.L.Sm. – 1, 2, 3, 6: AN, AT, FO, QU, SN (IU1, JM2, JV2, ZP4).

Porina oxneri R.Sant. – 1, 6: AN/ne+tw (GU4, IU2, JM1, JV3, ZP1).

Porina pseudohibernica Tretiach – 2, 3, 4, 6, 7: AN, AT, FO, QU, Ti (JM3, JV3, ZP5). Only recently recorded for the first time from the Caucasus and Russia (URBANAVICHUS et al. 2017).

Porina rosei Sérus. – 1: CB (JV1). Sterile, isidiate specimen; thalllus green-grey; isidia long, ±branched, fragile, with distinct papillae of outer mycobiont cells, but isidia not monilliform; cortex of isidia rather thin, indistinct.

Protoparmelia oleagina (Harm.) Coppins – 7: wood (JM1).

Pseudevernia furfuracea (L.) Zopf – 2, 3, 4, 5, 7: AN, AT, BL, FE, FO, PK, RP, SA, SC, TB, snag (GU4, IU9, ZP2).

Pseudoschismatomma rufescens (Pers.) Ertz & Tehler – 3: AP, AT (IU1, JM1, JV2, ZP1).

C ***Psoroglaena abscondita*** (Coppins & Vězda) Hafellner & Türk – 1, 2, 4: AG, AT, FO, SA, SN (JM1, JV2, ZP2).

Psoroglaena dictyospora (Orange) H.Harada – 1, 2, 3, 4, 5, 6: AC, AN, BL/log with bark, CB, FO, UG, log, snag (GU3, IU2, JM1, JV9, ZP10).

RC ***Psoroglaena stigonemoides*** (Orange) Henssen – 2: Ti (ZP1). A sterile specimen with distinctly papillate filaments under the microscope; branchlets 8–10 µm broad with tiny photobiont cells, seemingly arranged in two rows.

RC ***Ptychographa xylographoides*** Nyl. – 4: snag (IU1). Apothecia persistently narrow and elongate; exciple dark brown to black throughout; hymenium often with lengthwise partitions of dark sterile tissue; ascospores simple, 8.5–13 × 4.5–6.5 µm. This is the first report of the genus for Russia and Caucasus.

Punctelia borreri (Sm.) Krog – 5, 6: BL, Ti (GU1, ZP1).

Punctelia jeckeri (Roum.) Kalb – 1: UG (IU1).

C ***Puttea exsequens*** (Nyl.) Printzen & Davydov – 1, 2, 6: FO, QU – wood, log, snag (GU2, IU1, JM2, JV4, ZP4).

Pycnora praestabilis (Nyl.) Hafellner – 7: PK/wood, snag (GU2, JV1, ZP2).

C ***Pycnora xanthococca*** (Sommerf.) Hafellner – 7: PK/wood (JV1).

Pyrenula chlorospila (Nyl.) Arnold – 1, 2: AP, CA (GU2).

Pyrenula coryli A.Massal. – 1: FO (JV1).

Pyrenula laevigata (Pers.) Arnold – 1, 2, 6: AN, AP, CA, CB, FO (GU2, IU3, JV3, ZP2).

Pyrenula nitida (Weigel) Ach. – 1, 2, 3, 4, 5, 6: AG, AN, AP, AT, CA, CB, FO, QU, ST, Ti, UG (GU15, IU6, JM2, JV9, ZP5).

Pyrenula nitidella (Flörke ex Schaer.) Müll. Arg. – 1, 2, 6: AG, AN, CA, CB, FO, ST, Ti, UG (GU8, IU1, JM2, JV11).

Ramalina calicaris (L.) Fr. – 2, 3, 4, 5, 7: AN, AP, AT, BL, CB, FO, RP, SA, SC (GU4, IU14, JM3, JV3, ZP4). Two chemotypes revealed by TLC: I – with homosekikaic acid complex (ZP23276); II – lacking secondary metabolites (ZP22953).

Ramalina europaea Gasparyan, Sipman & Lücking – 1, 2, 4, 6: AN, AT, CA, FO, QU (GU1, JM2, ZP4).

Ramalina farinacea (L.) Ach. – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CA, CB, FO, QU, RP, SA, Ti, snag, stump (GU19, IU15, ZP7). TLC: usnic acid (present or absent), protocetraric acid (always present), norstictic acid with a satellite (connorstictic acid) (present or absent); two chemotypes revealed: I – with norstictic acid (ZP21641, 22696) and II – without norstictic acid (ZP22932, 23201, 23412).

Ramalina fraxinea (L.) Ach. – 3, 4, 5, 7: AN, AT, BL, FO, SA, SC (GU1, IU1, JM1, ZP1).

Ramalina obtusata (Arnold) Bitter – 1, 2, 3, 4, 5, 6, 7: AG, AN, AP, AT, BL, CB, FO, PK, QU, RP, TB, Ti, log, snag (GU16, IU15, JM3, JV4, ZP8).

Ramalina panizzei De Not. – 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, SA, SC (GU1, IU2, JM2, JV2, ZP6). TLC: homosekikaic and sekikaic acids, sometimes with an unknown fatty acid. Specimen ZP22766 was confirmed by ITS barcode.

Ramalina pollinaria (Westr.) Ach. s. lat. – 1, 2, 3, 4, 6, 7: AG, AN, AT, CA, CB, FO, QU, Ti (GU4, IU3, JM3, JV1). Three specimens collected by JM represent *R. pollinaria* s. str., other specimens may represent *R. europaea*.

Ramalina roesleri (Hochst. ex Schaer.) Hue – 1: dead tw of *Prunus*? (IU1). TLC: homosekikaic acid.

Ramalina sinensis Jatta – 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, SC (GU3, IU7, JV1, ZP1).

Ramalina thrausta (Ach.) Nyl. – 1, 2, 3, 6: AN, FO, RP, Ti (GU1, IU1, JV3, ZP2).

Ramboldia elabens (Fr.) Kantvilas & Elix – 7: PK/wood, snag (JM1, ZP1).

Ramonia chrysophaea (Pers.) Vězda – 1: QU (ZP1).

RC ***Ramonia dictyospora*** Coppins – 1: SN (JV1).

RC ***Ramonia luteola*** Vězda – 2, 3, 4, 5, 7: AN, AP, AT, CB, FO, SA, Ti (GU9, IU3, JM5, JV6, ZP11).

Reichlingia leopoldii Diederich & Scheid. – 3: AT (JM1). TLC: 2'-O-methylperlatolic acid (major), confluentic acid (minor). Based on molecular data it is recognized as a member of Arthoniomycetes, and was emended to include also *Arthonia zwackhii*, a chemically concordant fertile species (Frisch et al. 2014). In Russia and the Caucasus, this species was collected for the first time from the Republic of Adygea and from Krasnodar Territory (specimen in GLM; V. Otte in litt.).

Ricasolia amplissima (Scop.) De Not. – 1, 2, 3, 4, 6, 7: AN, AP, AT, BL, CB, FE, FO, QU, SA, UG (GU2, IU2, JV1, ZP4). A red-listed species in the Russian Federation (Trutnev et al. 2008). The fruticose growth form of *Ricasolia amplissima* ("*Dendriscocaulon*"-like photomorph with only cyanobacteria as photobionts) has a rather different ecology and distribution compared to its bi- or tripartite foliose photomorph (always with chlorophyte photobiont, sometimes with additional cyanobacteria in cephalodia). In the Caucasus, it often grows independent of the foliose *R. amplissima* thalli and beside bark it can inhabit other lichen species (e.g., *Cetrelia* sp., *Parmelina* sp. and other *Parmeliaceae*). We are listing the records of the "*Dendriscocaulon*"-like photomorph here separately from those of the foliose form: 3, 4, 7: AN, BL, FO, SA (GU2, IU4, JM2).

Rinodina albana (A.Massal.) A.Massal. – 1, 2, 3, 4, 5, 6, 7: AC, AN, AT, BL, CA, CB, FO, SA, UG, snag (GU3, JM6, JV7, ZP8).

C ***Rinodina buckii*** Sheard – 1: FO (ZP2). TLC: zeorin, pannarin. Fertile material (ZP22823) with teichophila-type ascospores; verified by H. Mayrhofer. The species was recently described as E North

American / E Asian taxon by Sheard et al. (2012) with a single record in Russia from Khabarovskiy region. Presence of the species in the Caucasus represents a large range expansion.

C ***Rinodina capensis*** Hampe – 1, 2, 3, 4, 5, 7: AN, AT, BL, FO, RP, log, snag (GU5, IU4, JM5, JV4, ZP7).

C ***Rinodina efflorescens*** Malme – 1, 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, Ti, snag (GU3, IU1, JM3, JV6, ZP3). TLC: pannarin, secalonic acid A.

C ***Rinodina excrescens*** Vain. – 1, 7: AN, FO (GU1, IU1, JM1, JV1). TLC: pannarin (traces).

Rinodina exigua (Ach.) Gray – 1, 2, 4: AG, AN, FO (GU1, IU1, JM1, ZP3).

C ***Rinodina freyi*** H.Magn. – 1, 2, 6: AN, CA, FO (GU2, JV2, ZP2).

Rinodina griseosoralifera Coppins – 4, 7: AT, BL, UG (GU1, IU1, JV2).

C ***Rinodina malangica*** (Norman) Arnold – 5: AT, SA (JV1, ZP2). The most similar mtSSU sequences (94–95 % in BLASTN) of the sterile specimen collected by JV belong to *Rinodina* species. Specimen ZP21628 bears few apothecia.

Rinodina orculata Poelt & M.Steiner – 1, 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, JC, PK/wood, SA, SC, TB, snag (GU7, IU6, JM5, JV14, ZP21).

RC ***Rinodina polysporoides*** Giralt & H.Mayrhofer – 1, 2, 6: AP, FO, Ti (GU4, JM2). The sample JM10654 identified by H. Mayrhofer.

Rinodina pyrina (Ach.) Arnold – 3, 4, 5: AN, CB (GU2, ZP1).

C ***Rinodina sheardii*** Tønsberg – 3, 4, 5, 7: AN, AT, BL, FO (JM1, JV2, ZP4). TLC: Secalonic acid A, zeorin, unidentified UV+ blue substance (both prior and after charring) at level of atranorin, not forming a visible spot. Caucasian material is sterile, forming delimited, brightly yellowish-greenish soralia on a grey thallus. It was compared to a sterile paratype material kindly provided by T. Tønsberg (TT18768, see Tønsberg 1992b).

Rinodina sophodes (Ach.) A.Massal. – 2, 3, 4, 5, 7: AP, AT, BL, CB, FO, SA, UG (GU4, IU2, JM4, JV9, ZP7).

Rinodina subpariata (Nyl.) Zahlbr. – 1, 2, 3, 4, 5, 6, 7: AG, AN, AT, BL, CB, FO, RP, SA, Ti, stump (GU9, IU3, JM6, JV10, ZP7).

C ***Rinodina tenuis*** Müll. Arg. – 1: FO (JM1). TLC: pannarin, zeorin. Identified by H. Mayrhofer.

NC ***Rinodina trevisanii*** (Hepp) Körb. – 1, 4, 5, 7: AN, AT, BL, CA, FO, SC, log, snag (GU2, IU2, JM4, JV3, ZP4). In Transcaucasia, this species has been reported from Georgia (Mayrhofer & Sheard 2007).

C ***Rinodina willeyi*** Sheard & Giralt – 1, 6: AG, FO (JV2, JM3, ZP1). TLC: pannarin, zeorin, traces of terpenoids. JM specimens identified by H. Mayrhofer. Caucasian material is sterile but corresponds well morphologically and chemically to description of the species (Sheard et al. 2012). It was recently reported from Russia from a single collection made in Kamchatka Peninsula (Sheard et al. 2017).

C ***Ropalospora viridis*** (Tønsberg) Tønsberg – 1, 2, 6: CB, FO (JM2, JV1, ZP2).

Rostania occultata (Bagl.) Otálora, P.M.Jørg. & Wedin – 1, 2, 4, 5: AT, CA, FO, UG (GU2, IU1, JM2, ZP1).

C ***Sagedia*** aff. ***mastrucata*** (Wahlenb.) A.Nordin, S.Savić & Tibell – 4, 5: BL, FO (ZP4). TLC: norstictic acid. Unidentified species with a thin glossy thallus and small delimited soralia. It would be keyed out as *Aspicilia grisea* sensu British authors (Fletcher et al. 2010). *Sagedia mastrucata* is the closest species according to DNA sequences (ITS, mtSSU; ML tree done based on GenBank and own unpublished data).

C ***Sarcosagium campestre*** (Fr.) Poetsch & Schied. – 4, 6: AN/wood, snag (JM1, ZP2).

C ***Schaereria corticola*** Muhr & Tønsberg – 4, 5: AT/tw, BL, snag with bark (IU1, JV1, ZP2). TLC (ZP21398, 23342): gyrophoric and 5-O-methylhiascic acid (trace). Persistently delimited brown soralia. MtSSU sequence (JV16547) has >97 % identity with *S. corticola* (sample Tønsberg 28432).

Schismatomma pericleum (Ach.) Branth & Rostr. – 1, 2, 3, 4, 6, 7: AN, FO, TB, Ti (GU3, IU5, JM3, JV4, ZP1).

NC ***Sclerophora amabilis*** (Tibell) Tibell – 2, 3: FO (JV1, ZP1). In Transcaucasia, this species has been reported from Abkhazia (Titov 1998).

Sclerophora farinacea Chevall. – 2, 3, 6: AP, FO (JM1, JV1, ZP1).

Sclerophora pallida (Pers.) Y.J.Yao & Spooner – 1, 2, 3, 4: FO, QU (GU2, JM2, ZP1).

NC ***Sclerophora peronella*** (Ach.) Tibell – 4: AT (GU1). In Transcaucasia, this species has been reported from Abkhazia (Titov 1998).

Scoliciosporum chlorococcum (Graewe ex Stenh.) Vězda – 1, 3, 4, 5: AG/tw, AN/tw, BL, FO/tw, RP (IU1, JV1, ZP3).

C ***Scoliciosporum sarothamni*** (Vain.) Vězda – 1, 2, 6, 7: AG, FO/tw, TB/tw (IU1, JV3). Sterile specimens may represent the very similar *S. gallurae*.

Scoliciosporum schadeanum (Erichsen) Vězda – 2, 6: AN, FO, QU (JV1, ZP4).

Scoliciosporum umbrinum (Ach.) Arnold – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, RP, SA, SC, TB, UG – mainly tw, snag (GU11, IU5, JM3, JV12, ZP11).

Scutula circumspecta (Vain.) Kistenich, Timdal, Bendiksby & S.Ekman – 1, 2, 3, 4, 5, 6, 7: AN, AP, AT, CB, FO, QU, UG (GU1, IU1, JM5, JV5, ZP11).

Scytinium gelatinosum (With.) Otálora, P.M Jørg. & Wedin – 2: FO/bry (JM1).

Scytinium lichenoides (L.) Otálora, P.M.Jørg. & Wedin s. lat. – 1, 2, 3, 4, 6, 7: AT, CA, CB, FO, QU, SN, Ti, UG/bry, log (GU7, IU9, JV2, ZP2).

Scytinium pulvinatum (Hoffm.) Otálora, P.M.Jørg. & Wedin – 1, 2, 3, 4, 6, 7: AG, AN, AT, CB, FO, QU, RP, ST, Ti/bry, UG (GU2, IU3, JM1, JV1, ZP2).

Scytinium subtile (Schrad.) Otálora, P.M.Jørg. & Wedin – 4, 6: AN, FO/bry (GU1, JM2, JV2).

Scytinium teretiusculum (Wallr.) Otálora, P.M Jørg. & Wedin – 1, 2, 3, 4, 6, 7: AP, AT, CB, FO, QU, Ti, UG, snag (GU4, IU5, JM4, JV7, ZP7).

C ***Steinia geophana*** (Nyl.) Stein – 2, 3, 4, 5: log, snag (JV3, ZP1).

C ***Strangospora microhaema*** (Norman) R.A.Anderson – 1: AC/tw (ZP1).

C ***Strangospora moriformis*** (Ach.) Stein – 7: PK (ZP1).

Strigula jamesii (Swinscow) R.C.Harris – 2: CB (ZP1).

Strigula stigmatella (Ach.) R.C.Harris – 2, 3, 4, 6, 7: AT, CB, FO, QU, SA, Ti – incl. bryophytes (GU5, IU2, JM4, JV12, ZP12).

Tephromela atra (Huds.) Hafellner – 2, 3, 4, 5, 7: AN, AP, AT, CB, FO, SA (GU4, IU8, JV5, ZP7).

Tetramelas chloroleucus (Körb.) A.Nordin – 5, 7: AT, BL, SA (ZP5).

Tetramelas triphragmioides (Anzi) A.Nordin & Tibell – 3, 5: AN, AT, BL (GU1, IU2, JV2, ZP1).

Thelenella muscorum (Fr.) Vain. – 2, 3, 4: AT/bry, CB/bry, FO/bry (IU1, JM1, JV2, ZP1).

C ***Thelenella pertusariella*** (Nyl.) Vain. – 3, 4, 5, 6, 7: AG, FO, SC (GU1, JV3, ZP6).

Thelocarpon epibolum Nyl. – 3: AN, FO (also on *Peltigera* sp.), log (JV2).

C ***Thelocarpon intermediellum*** Nyl. – 4: snag (IU1, JM1).

C ***Thelocarpon lichenicola*** (Fuckel) Poelt & Hafellner – 2, 3: log (GU1, ZP1).

RNC ***Thelopsis flaveola*** Arnold – 2, 4, 5: AP, AT, FO, Ti (GU2, IU2, JM2, JV4, ZP5). In Transcaucasia, this species has been reported from Abkhazia (Urbanavichus & Urbanavichene 2012).

Thelopsis rubella Nyl. – 2, 3, 4, 6: AN, CB, FO, QU, Ti (IU1, JV2, ZP7).

Thelotrema lepadinum (Ach.) Ach. – 1, 2, 6: AN, CB, FO, RP, Ti (GU1, IU2, JM3, JV2, ZP4).

C ***Toensbergia leucococca*** (R.Sant.) Bendiksby & Timdal – 5, 7: BL (GU1, JV1, ZP1).

Toniniopsis subincompta (Nyl.) Kistenich, Timdal, Bendiksby & S.Ekman – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, SA, SN, UG, log, snag (GU11, IU6, JM3, JV18, ZP12).

RC ***Topelia jasonhurii*** L.Lőkös, E.Farkas & S.Y.Kondr. – 2: AN (JM1). The specimen fully corresponds to the description of this species in Kondratyuk et al. (2013). In the field, *Topelia jasonhurii* can resemble some *Thelopsis* species, but it differs for example by muriform ascospores. This taxon has been so far known only from its type locality in South Korea.

Trapelia corticola Coppins & P.James – 1, 2, 3, 4, 5, 6, 7: AG, AN/wood, QU, log, snag, stump (GU5, IU3, JM4, JV14, ZP3).

Trapeliopsis flexuosa (Fr.) Coppins & P.James – 1, 2, 3, 4, 5, 7: BL, PK, log, snag, stump (GU1, IU2, JM1, ZP2).

C ***Trapeliopsis gelatinosa*** (Flörke) Coppins & P.James – 1, 2, 3, 5: log, snag (JV3).

C ***Trapeliopsis glaucolepidea*** (Nyl.) Gotth. Schneid. – 3, 7: snag (JM1, JV2).

Trapeliopsis granulosa (Hoffm.) Lumbsch – 3, 7: AN, PK, snag (JV2).

Trapeliopsis pseudogranulosa Coppins & P.James – 1, 2, 3, 5: BL, snag (JM2, JV1, ZP2).

Trapeliopsis viridescens (Schrad.) Coppins & P.James – 1, 2, 3, 4, 7: FO, log, snag, stump (GU1, JV).

Tuckermannopsis chlorophylla (Willd.) Hale – 2, 3, 4, 5, 7: AN, AT, BL, CB, FO, PK, QU, TB, snag (GU3, IU10, JV1, ZP1).

Usnea articulata (L.) Hoffm. – 1, 2, 3, 4, 5, 7: AN, BL, CB, FO, PK, QU, RP, UG (GU1, IU2, JM1, JV4, ZP2).

Usnea barbata (L.) F.H.Wigg. – 2, 3, 4, 5, 6, 7: AN, AT, BL, FO, RP (GU4, IU4, JM6). Selected specimens verified by P. Clerc.

Usnea cavernosa Tuck. – 2, 3, 4, 5, 7: AN, AT, FO, PK, snag (GU4, IU3, ZP1). Specimens from plots 3 and 5 formed a compacted medulla.

Usnea dasopoga (Ach.) Nyl. – 1, 2, 3, 4, 5, 6, 7: AN, BL, CB, FO, PK, RP, snag (GU5, IU4, JM3, JV6, ZP1).

Usnea flavocardia Räsänen – 1: AN (JM1).

Usnea florida (L.) F.H.Wigg. – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, QU, RP, SA, SC, UG, log, snag (GU13, IU7, JV2, ZP3). A red-listed species in the Russian Federation (Trutnev et al. 2008).

Usnea glabrescens (Nyl. ex Vain.) Vain. var. ***glabrescens*** – 1, 2, 3, 4, 6, 7: AN, CB, FO, RP, snag (GU9, IU3).

var. ***fulvoreagens*** Räsänen – 1, 2, 4, 6: AN, CB, FO, QU, Ti (GU6, IU2, JM2, ZP3).

Usnea hirta (L.) F.H.Wigg. – 5, 7: AN, BL, PK, snag (GU1, JV1, ZP1).

Usnea intermedia (A.Massal.) Jatta – 2, 3, 4, 5, 6, 7: AN, AP, AT, BL, CB, FO, SA, SC, snag (GU6, IU12, JM4, JV3, ZP6).

Usnea longissima Ach. – 1, 2, 3, 6: AN, CA, CB, FO, QU, RP (GU10, IU5, JM, JV, ZP2).

Usnea perplexans Stirt. – 1, 3, 4, 5, 7: AN, AT, BL, FO, SA, SC, snag (GU6, IU7, JM5, JV2, ZP3). Specimens collected by JM verified by P. Clerc.

Usnea subfloridana Stirt. – 1, 2, 3, 4, 5, 6, 7: AN, AT, BL, CB, FO, QU, PK, RP, QU (GU3, IU3, JM3, JV5, ZP4).

Usnea substerilis Motyka – 4, 5, 7: AN, BL, SC (GU2, IU2, JV2).

Usnea wasmuthii Räsänen – 2, 6: FO (JM3). Specimens collected by JM analyzed by TLC and verified by P. Clerc.

Usnocetraria oakesiana (Tuck.) M.J.Lai & J.C.Wei – 1: FO (GU1, JM1, JV1, ZP1).

Vahliella saubinetii (Mont.) P.M.Jørg. – 1, 2, 7: AN, AT, FO, QU, Ti (GU2, IU3, JM2).

Varicellaria hemisphaerica (Flörke) I.Schmitt & Lumbsch – 1, 2, 3, 4, 6, 7: AG, AN, AT, BL, CB, FO, QU, RP, SA, Ti, snag (GU6, IU10, JM4, JV5, ZP3). TLC: gyrophoric and lecanoric acids (+ an unknown fatty acid in JV15557).

Verrucaria breussii Diederich & van den Boom – 1, 2, 6: AG, FO (JV4, ZP1). All specimens have no involucrellum and the exciple is colourless in the lower part. As for the spore size the material is not homogenous and more taxa may be included. Specimen JV15453 contains usually smaller ascospores (c. 16–20 µm long), but at least some larger ascospores (20–25 µm long) were also present. Specimen ZP22986 fits well this taxon with ascospores c. 23 × 10.5 µm.

RC ***Verrucaria hegetschweileri*** Körb. ex Nyl. (*nom. illeg.*) non (Naegeli ex Hepp) Garov. – 2: QU (ZP1). Small black perithecia up to 0.2 mm, lacking discernible involucrellum; pigments in the perithecial wall reaching to the base; ascospores ellipsoid to ovoid (subpyriform) 12–16.5 × 6–7 µm.

Verrucaria cf. ***lignicola*** Zschacke – 1: AC (ZP1). The involucrellum is well developed reaching 2/3 to the base. The voucher ZP23166 was identified by O. Breuss. It is similar to *Verrucaria bryoctona* with its relatively narrowly ellipsoid ascospores (17–21 × 6.5–8 µm) which however lack gelatinose appendages; unlike *V. bryoctona* the involucrellum is developed, but hardly discernible from the perithecial wall, and the thallus is more or less areolate-squamulose but not granular.

Vezdaea aestivalis (Ohlert) Tscherm.-Woess & Poelt – 1, 2: Ti, log (ZP2).

C ***Vezdaea retigera*** Poelt & Döbbeler – 1, 6: AG, FO, log (JV1, ZP2). Sterile specimens identified on basis of characteristic goniocysts with short spines.

C ***Vezdaea rheocarpa*** Poelt & Döbbeler – 2, 7: AN, QU (JM1, ZP1). Sterile specimen ZP22936 with goniocysts possessing horn-like hyphal apices c. 8 µm high.

C ***Violella fucata*** (Stirt.) T.Sprib. – 2, 5, 6, 7: AN, BL, CB, FO, PK/wood (JM3, ZP3). TLC: atranorin, fumarprotocetraric acid.

Vulpicida pinastri (Scop.) J.-E. Mattsson & M.J. Lai – 2, 5, 7: AN, BL, FO, RP, SC, stump (GU2, IU4, JM, JV1, ZP1).

RC ***Wadeana minuta*** Coppins & P.James – 4: FO (JV1). This is the first report of the genus for Russia and Caucasus.

RC ***Waynea giraltiae*** van den Boom – 7: UG (GU1, ZP1). Characteristic species when fertile. Hairy squamules are somewhat similar to those of unrelated *Agonimia opuntiella* when young, but distinctly larger with age. In the specimen ZP21598 only one apothecium is present, habitually very similar to the specimen from Slovakia (ZP16946). Up to now reported from the Iberian Peninsula, Italy and Slovakia (van den Boom 2010, Palice et al. 2018, Ravera et al. 2018).

Xanthomendoza ulophyllodes (Räsänen) Søchting, Kärnefelt & S.Y.Kondr. – 4, 7: AT (JM, JV2). Specimen JV16088 was confirmed by ITS barcode (98–100% identity by BLASTN). Other specimens with similar morphology are suggested to belong here too.

Xanthoria parietina (L.) Th.Fr. – 2, 3, 6: AN, UG (GU1, JV1, ZP1).

Xylographa parallela (Ach.) Fr. – 2, 3, 4, 5, 7: CB/wood, PK/wood, log, snag, stump (GU3, IU2, JV3, ZP1). TLC (ZP22099): stictic acid (major), norstictic acid (minor). Specimens tentatively identified as *Xylographa pallens*, following the monograph by Spribille et al. (2014), were revised as *X. parallela* on the basis of mtSSU and ITS barcode.

C ***Xylographa soralifera*** Holien & Tønsberg – 3, 4, 7: log, snag, stump (GU3, JV2, ZP1).

C ***Xylographa trunciseda*** (Th.Fr.) Minks ex Redinger – 2, 3, 4, 6, 7: log, snag, stump (GU3, IU1, JV3, ZP4).

Xylographa vitiligo (Ach.) J.R.Laundon – 2, 3, 4, 7: AN/wood, PK/wood, log, snag, stump (GU2, IU4, JM4, JV4, ZP1).

Zwackhia viridis (Ach.) Poetsch & Schied. – 1, 2, 4, 6: AN, CB, FO, Ti (GU5, IU2, JM2, JV7, ZP3).

Lichenicolous fungi

Abrothallus bertianus De Not. – 2, 3, 4, 5: on *Melanelixia glabratula*, *M. subaurifera*, *Melanohalea exasperata*, AT, BL, FO (GU2, IU2).

C ***Abrothallus nephromatis*** Suija & Pérez-Ortega – 5: on *Nephroma parile*, SC (GU1, IU1).

Abrothallus parmeliarum (Sommerf.) Arnold – 5: on *Parmelia ernstiae*, *P. sulcata*, BL, FO, SC (GU2, IU2, JM1, ZP1).

Abrothallus peyritschii (Stein) Kotte – 5: on *Vulpicida pinastri*, BL (IU1, JM1, ZP1).

C ***Abrothallus suecicus*** (Kirschst.) Nordin – 5: on *Ramalina panizzei*, AT (GU1).

Acolium sessile (Pers.) Arnold – 3: on *Pertusaria coccodes*, AN (JV1).

C ***Arthonia biatoricola*** Ihlen & Owe-Larss. – 3, 4, 5, 7: on *Biatora efflorescens*, AN, AT, PK/wood, snag, stump (GU3, IU3, JV3, ZP1).

Arthonia epiphyscia Nyl. – 1, 5: on *Physcia stellaris*, *Physciella chloantha*, BL, SN (GU1, IU1).

Arthonia phaeophysciae Grube & Matzer – 1: on *Phaeophyscia pusilloides*, AN (GU1).

Arthonia subfuscicola (Linds.) Triebel – 4, 7: on *Lecanora carpinea*, AN, FO, SA (GU2, IU1).

RC ***Arthonia vorsoeensis*** Alstrup – 3: on *Amandinea punctata*, AT (GU1). Hymenium 40–50 µm high, gel I+ blue; asci arthonioid, clavate, apically I-, 8-spored; ascospores l-septate, 9–11 × 3.5–4 µm, long remaining colourless (Alstrup et al. 2004).

Arthophacopsis parmeliarum Hafellner – 5, 7: on *Parmelia sulcata*, SA, SC, TB (GU2, IU2).

C ***Arthrorhaphis aeruginosa*** R.Sant. & Tønsberg – 7: on *Cladonia* sp. (JM1).

Bachmanniomyces punctum (A.Massal.) Diederich & Pino-Bodas – 7: on *Cladonia coniocraea*, PK (IU1).

Biatoropsis usnearum Räsänen s. str. – 2: on *Usnea* sp. (JM1).

Chaenothecopsis brevipe**s** Tibell – 2, 6: on *Inoderma byssaceum*, AN, QU (JV2).

NC ***Chaenothecopsis vainioana*** (Nádv.) Tibell – 2, 7: on *Arthonia* sp., PK/wood, snag (GU1, IU1). In Transcaucasia, this species has been reported from Abkhazia (Titov 2006).

Dactylospora deminuta (Th.Fr.) Triebel – 2: on *Mycobilimbia epixanthoides*, QU (ZP1).

Dactylospora lobariella (Nyl.) Hafellner – 2, 4: on *Lobaria pulmonaria*, AT, CB (GU2, JM1).

Dactylospora parasitica (Flörke ex Spreng.) Zopf – 4: on *Lepra albescens* (JM1).

C ***Didymocyrtis*** cf. ***cladoniicola*** (Diederich, Kocourk. & Etayo) Ertz & Diederich – 7: on *Lecanora carpinea*, SA (IU1).

RC ***Didymocyrtis melanelixiae*** (Brackel) Diederich, Harris & Etayo – 5: on *Parmelia sulcata*, BL (IU1).

RC ***Epigloea urosperma*** Döbbeler – 2: on *Placynthiella icmalea*, log (IU1, JV1). Asci 34 µm long, with 32 ascospores; ascospores l-septate, 8.4 × 2 µm with tail 4 µm.

Heterocephalacria bachmannii (Diederich & M.S.Christ.) Millanes & Wedin – 1: on *Cladonia coniocraea*, log, stump (GU2).

Homostegia piggotii (Berk. & Broome) P.Karst. – 5, 6: on *Parmelia sulcata*, BL, Ti (GU1, ZP1).

Intralichen christiansenii (D.Hawksw.) D.Hawksw. & M.S.Cole – 4: on *Lecanora intumescens*, FO (GU1).

Kalchbrenneriella cyanescens (Kalchbr.) Diederich & M.S.Christ. – 7: on *Usnea subfloridana*, AN (IU1). In Russia and Caucasus, this species was collected for the first time from the Republic of Adygea (specimen in GLM; V. Otte in litt.).

Lichenoconium lecanorae (Jaap) D.Hawksw. – 4, 7: on *Hypogymnia* sp., *Lecanora carpinea*, *Parmeliopsis ambigua*, AT, SA, TB (GU1, IU2, JM1).

Lichenoconium usneae (Anzi) D. Hawksw. – 4, 5: on *Melanohalea exasperata*, *Physconia perisidiosa*, *Ramalina panizzei*, AN, AT (GU3).

Lichenopeltella peltigericola (D.Hawksw.) R. Sant. – 7: on *Peltigera praetextata*, BL (IU1).

Lichenostigma alpinum (R.Sant., Alstrup & D.Hawksw.) Ertz & Diederich – 3: on *Cladonia coniocraea*, stump (IU1).

C ***Monodictys cellulosa*** S.Hughes – 7: on *Arthonia vinosa*, snag (GU1).

C ***Monodictys epilepraria*** Kukwa & Diederich – 2: on *Lepraria rigidula*, RP (GU1).

Muellerella lichenicola (Sommerf. ex Fr.) D.Hawksw. – 5: on *Caloplaca cerina*, FO (IU1).

RC ***Muellerella polyspora*** Hepp ex Müll.Arg. – 2, 4: on *Arthonia radiata*, FO (GU2). Asci multispored; ascospores 5–7 × 2.5–3 µm; perithecia becoming ± superficial.

Myxophora leptogiophila (Minks ex G.Winter) Nik.Hoffm. & Hafellner – 2: on *Collema flaccidum*, QU (ZP1).

Opegrapha rotunda Hafellner – 4: on *Physconia distorta*, AT (IU1).

Perigrapha superveniens (Nyl.) Hafellner – 4, 5: on *Parmelia sulcata*, AN, BL (JV1, ZP1).

RNC ***Phacographa zwackhii*** (A.Massal. ex Zwackh) Hafellner – 3, 4, 6: on *Phlyctis argena*, AN, AT (IU1, JM2, ZP2). In Transcaucasia, this species has been recently reported from Armenia (Gasparyan et al. 2015).

Plectocarpon lichenum (Sommerf.) D.Hawksw. – 2, 4: on *Lobaria pulmonaria*, CB, FO, QU (GU1, IU2, JM1).

Plectocarpon scrobiculatae Diederich & Etayo – 5: on *Lobarina scrobiculata*, BL (IU1).

RC ***Pronectria pilosa*** Etayo & López de Silanes – 5: on *Collema subnigrescens*, SC (IU1). Originally decribed from *Collema furfuraceum*. Ascomata yellowish, 50–80 µm in diam., with normally setose

papilla around ostiole; ascospores ellipsoid to almost fusiform, hyaline, 1-septate, slightly constricted in the septum, not ornamented, 10–13.5(–15) × 3.3–3.5 µm (López de Silanes et al. 2009).

Pseudoseptoria usneae (Vouaux) D.Hawksw. – 4, 5, 7: on *Usnea perplexans*, *Usnea* sp., AT, BL, FO (GU1, IU2).

Raesaenenia huuskonenii (Räsänen) D.Hawksw., C.Boluda & H.Lindgren – 3, 4, 7: on *Bryoria nadvornikiana*, *Bryoria* sp., AN, AT, FO, PK (GU6, IU4).

RC ***Rhymbocarpus pubescens*** (Etayo & Diederich) Diederich & Etayo – 4: on *Lepraria finkii*, AT (GU1). The species is well characterized within the genus by its hairy exciple and association with *Lepraria*. Another species occurring on the same host genus, *R. neglectus* (Vain.) Diederich & Etayo, lacks the excipular hairs (Etayo & Diederich 1998, Diederich & Etayo 2000).

Sclerococcum serusiauxii Boqueras & Diederich – 4: on *Parmelina carporrhizans*, AT (GU1).

Sclerococcum simplex D.Hawksw. – 2: on *Lepra trachythallina*, CB (IU1).

Sphaerellothecium propinquellum (Nyl.) Cl.Roux & Triebel – 7: on *Lecanora carpinea*, AT (GU1).

Sphaerellothecium pumilum (Lettau) Nav.-Ros., Cl.Roux & Hafellner – 7: on *Physcia aipolia*, SA (IU1).

Sphinctrina anglica Nyl. – 7: on *Protoparmelia oleagina*, wood (JM1).

Sphinctrina turbinata (Pers.) De Not. – 2, 4: on *Pertusaria coronata*, *P. pertusa*, CB, FO (GU3, ZP1).

Stigmidium buelliae Zhurb. & Himelbrant – 7: on *Buellia disciformis*, FO (GU1).

Stigmidium congestum (Körber) Triebel – 4, 7: on *Lecanora carpinea*, *L. chlarotera*, *L. leptyrodes*, *L. pulicaris*, AN, AT, SA (GU5, IU2, JM2, ZP1).

Stigmidium eucline (Nyl.) Vězda – 2, 3: on *Varicellaria hemisphaerica*, AN, Ti, snag (GU2, IU2).

Stigmidium lecidellae Triebel, Cl.Roux & Le Coeur – 4: on *Lecidella elaeochroma*, FO (ZP1).

Taeniolella delicata M.S.Christ. & D.Hawksw. – 7: on *Lecidella flavosorediata*, snag (GU1).

RC ***Taeniolella friesii*** (Hepp) Hafellner – 2, 3, 6: on *Strigula stigmatella*, AT, CO, FO, QU (GU2, IU1, JV2, ZP3). On thallus of *Strigula stigmatella* and partly on tree bark.

Tremella cetrariicola Diederich & Coppins – 3, 7: on *Tuckermannopsis chlorophylla*, FO (GU1, JV1).

Tremella hypogymniae Diederich & M.S.Christ. – 4: on *Hypogymnia* sp. (JM1).

RC ***Unguiculariopsis acrocordiae*** (Diederich) Diederich & Etayo – 2: on *Acrocordia gemmata*, CO (ZP1). *U. acrocordiae* is well recognizable due to its tiny reddish/brownish ascomata with hairy margin and its strict association with *Acrocordia gemmata* (Etayo & Diederich 2000, Lawrey & Diederich 2018).

Vouauxiella lichenicola (Linds.) Petr. & Syd. – 5: on *Lecanora praesistens*, AT (IU1).

Not or doubtfully lichenized fungi

C ***Actidium hysterioides*** Fr. – 2: wood (ZP, no voucher).

NC ***Agyrium rufum*** (Pers.) Fr. – 3, 7: AN/wood (ZP2). In Transcaucasia, this species has been reported from Abkhazia (Nakhutsrishvili 1986).

C ***Anisomeridium macrocarpum*** (Körb.) V.Wirth – 1, 2, 4, 6: AT, CA, FO, QU (GU2, JV2).

Atichia glomerulosa (Ach.) Stein – 2, 4: AN/ne, RP/le (GU1, ZP2).

Chaenothecopsis debilis (Sm.) Tibell – 3, 4, 7: FO/snag, wood (IU2, JM1, JV1).

Chaenothecopsis pusilla (Ach.) A.F.W.Schmidt – 2, 7: snag (GU2, JV1).

Chaenothecopsis pusiola (Ach.) Vain. – 3, 4, 7: AN/wood, snag, stump (GU1, IU1, JV1, ZP1).

Chaenothecopsis rubescens Vain. – 7: AN (IU1).

Chaenothecopsis savonica (Räsänen) Tibell – 7: AN, snag (GU1, IU2).

Chaenothecopsis viridireagens (Nádv.) A.F.W.Schmidt – 4, 5, 7: AN, snag (GU2, IU1).

Cryptodiscus pallidus (Pers.) Corda – 1, 2, 5, 7: log, snag, stump (GU1, IU2, JM2, JV1, ZP3).

RC ***Cyrtidula major*** (Nyl.) Vain. – 5: BL (GU1, JM1).

C ***Dennisiella babingtonii*** (Berk.) Bat. & Cif. – 2: RP/le (GU1, JV1).

C ***Exarmidium hemisphaericum*** (Fr.) Aptroot – 2, 4: log, snag (GU3, IU1). Ascospores 28–30 × 8–10 µm.

C ***Exarmidium inclusum*** (Pers.) Aptroot – 2, 3, 4, 7: log, snag (JV4, ZP3).

C ***Hysterium pulicare*** (Lightf.: Fr.) Pers. – 1: QU (ZP1).

RC ***Karschia cezannei*** Ertz & Diederich – 2: QU, Ti (ZP3). This recently described corticolous taxon has been formerly apparently confused with members of *Melaspilea* s. lat., well distinguishable from them on account of the periphyses in inner part of the apothecial margin and amyloid asci (see Ertz & Diederich 2015). Oak and lime-trees were reported also from original material as substrates of this taxon.

NC ***Kirschsteiniothelia aethiops*** (Berk. & Curtis) D.Hawksw. – 1, 2: FO (GU1, ZP1). In Transcaucasia, this species has been recently reported from Georgia (Nakhutsrishvili 1986).

RC ***Kirschsteiniothelia recessa*** (Cooke & Peck) D.Hawksw. – 2, 7: AN, CB, UG (GU1, JV1, ZP1). Ascospores large, 18–20 × 7 µm.

C ***Melaspileella proximella*** (Nyl.) Ertz & Diederich – 1, 2, 3, 4, 7: AC, AN, FO (JV2, ZP5).

C ***Microcalicium ahlneri*** Tibell – 1, 7: QU/wood, snag (IU1, ZP1).

Microcalicium disseminatum (Ach.) Vain. – 2, 4: AN, snag (GU2).

Mycocalicium subtile (Pers.) Szatala – 2, 3, 4, 7: AN/wood, AT/wood, PK/wood, QU/wood, SA/wood, snag, stump (GU9, IU6, JM4, JV6, ZP2).

Mycomicrothelia wallrothii (Hepp) D.Hawksw. – 7: BL (JV1).

C ***Mycoporum*** cf. ***antecellens*** (Nyl.) R.C.Harris – 4, 7: AN, AT, snag (GU1, JV2). Not lichenized, but frequently accompanied by free-living algae. Forming extensive pale patches with a pink tinge on smooth bark; ascospores 3-septate, 25–30 × 8–10 µm, always colourless, without a perispore; perithecial wall K-; asci with a distinct thollus; slender paraphysoids present; conidia c. 4–5 × 1 µm.

Naetrocymbe fraxini (A.Massal.) R.C.Harris – 5: SA (JM1).

Naetrocymbe punctiformis (Pers.) R.C.Harris – 1, 3, 4, 5, 7: AN/tw, AT/tw, BL, CB, FO/tw, SA, Ti, UG/tw (GU4, IU2, JM1, JV7, ZP1).

Peridiothelia fuliguncta (Norman) D.Hawksw. – 2: CB, Ti (GU1, ZP1).

RC ***Pseudotryblidium neesii*** (Flot.) Rehm – 2, 6, 7: AN (ZP3). This is a distinctive non-lichenized leotialean species confined to bark of *Abies* and likely overlooked by mycologists since it is often associated with lichens at bases of fir-trees. It was even regarded as a lichenicolous fungus by some earlier authors (see Zimmermann 2011). The Caucasian material grows along with sterile thalli of *Loxospora elatina* but evidently not directly associated with it. This species is quite easily identifiable due to its relatively large, basally constricted dark apothecia reaching 1 mm in diameter. In sections a yellow pigment turning violet by KOH and two-celled ascospores in cylindrical asci are the most distinctive features

for the taxon (see Zimmermann 2011). Until now it was reported only from Europe, exclusively from bark of *Abies alba*. It is likely a widespread species and could indicate nativeness of stands with *Abies alba* and *A. nordmanniana*.

Rebentischia massalongii (Mont.) Sacc. – 1, 4, 7: AN, AT, UG (IU2, JV1). Only recently recorded for the first time from the Caucasus and Russia (Urbanavichene & Urbanavichus 2018).

C ***Rhizodiscina lignyota*** (Fr.) Hafellner – 7: wood (ZP1).

Sarea difformis (Fr.) Fr. – 3: AN (JM1).

Stenocybe pullatula (Ach.) Stein – 1: AG, CB (IU3).

Stictis radiata (L.) Pers. – 1, 2: dead twig of deciduous trees, Ti (IU1, ZP1).

We found a total of 659 species (ca. 16.1 % of the lichen flora of Russia, and ca. 32 % of the lichen flora of the Northern Caucasus) in seven 1-hectare plots, including 564 lichenized, 61 lichenicolous and 34 allied non- or facultatively lichenized fungi that are often studied by lichenologists. Plots 2, 4 and 7 had the most diverse lichen flora with more than 300 recorded species; the lowest species richness, below 250 species, was observed in plots 5 and 6 (Table 1). Microlichens predominate in our species list – of 564 species, 407 were microlichens (ca. 72 % of lichenized taxa). The ratio of macrolichensis was higher at upper altitudes (plots 4, 5 and 7; Table 1).

Table 1. Total species richness and species richness in morpological and ecological groups observed in the investigated plots. Plots are ordered according to increasing altitude.

	Plot 1 700 m	**Plot 6 720 m**	**Plot 2 940 m**	**Plot 3 1460 m**	**Plot 4 1720 m**	**Plot 7 1830 m**	**Plot 5 1900 m**	**Total**
Lichens	298	230	331	288	314	340	224	564
microlichens	219	161	235	199	215	232	134	407
macrolichens	79	69	96	89	99	108	90	157
% micro-/macrolichens	73.5/26.5	70/30	71/29	69/31	68/32	68/32	60/40	72/28
cyanolichens	17	17	28	20	22	25	15	34
the same, %	5.7	7.4	8.5	6.9	7	7.4	6.8	6
with trentepohlioid photobiont	50	39	51	43	38	27	15	79
the same, %	16.8	16.9	15.4	14.9	12.1	8	6.7	14
Lichenicolous fungi	3	4	16	10	21	20	17	61
Non-lichenized fungi	10	2	17	8	13	19	5	34
All groups	311	236	364	306	348	379	246	659

We found high diversity in the genera *Lecanora* (29 species), *Arthonia* s. lat. (21), *Bacidia* s. lat. (18), *Biatora* (18), *Caloplaca* s. lat. (18), *Micarea* (18), *Rinodina* (18), *Pertusaria* s. lat. (15), *Usnea* (14), *Chaenotheca* (13), *Ochrolechia* (10), *Ramalina* (10) and *Gyalecta* (8). On the other hand, we found only a few species and low abundances of nitrophilous lichen genera, e.g. *Physconia* (3 species), *Xanthoria* s. lat. (4), *Phaeophyscia* (5) and *Physcia* (6).

The highest numbers of species were recorded from bark/twigs of *Abies nordmanniana* (378 species) and *Fagus orientalis* (353), lower numbers are from *Acer trautvetteri* (256), *Betula litwinowii* (199) and *Carpinus betulus* (184), and the lowest numbers are from *Quercus* (137), *Ulmus glabra* (124), *Sorbus aucuparia* (120), *Tilia begoniifolia* (89) and others. Wood-dwelling species (223) were recorded from snags (188) and logs (108).

Discussion

Significant extensions of known geographical range

149 species (116 lichens, 17 lichenicolous fungi, 16 saprobic fungi) are new to the Northern Caucasus (= Russian part of the Caucasian Mts), including 133 species (104 lichens, 15 lichenicolous fungi, 14 saprobic fungi) new to the Caucasus Mts.

Lichen species new to Russia are *Andreiomyces obtusaticus*, *Bacidina* mendax, *Biatora aegrefaciens*, *B. bacidioides*, *B. chrysanthoides*, *Biatorella dryophila*, *Buellia iberica*, *Cliostomum haematommatis*, *Endohyalina ericina*, *Fellhanera christiansenii*, *Gyalidea minuta*, *Japewia aliphatica*, *Lecanora barkmaniana*, *L. subravida*, *Lecidea strasseri*, *Leptogium hibernicum*, *Lithothelium hyalosporum*, *L. phaeosporum*, L. *septemseptatum*, *Loxospora cristinae*, *Melanelixia epilosa*, *Micarea nowakii*, *M. perparvula*, *Opegrapha trochodes*, *Orcularia insperata*, *Parvoplaca servitiana*, *Phylloblastia inexpectata*, *Psoroglaena stigonemoides*, *Ptychographa xylographoides*, *Ramonia dictyospora*, *R. luteola*, *Rinodina polysporoides*, *Thelopsis flaveola*, *Topelia jasonhurii*, *Verrucaria hegetschweileri*, *Wadeana minuta* and *Waynea giraltiae*.

Lichenicolous fungi new to Russia are *Arthonia vorsoeensis*, *Didymocyrtis melanelixiae*, *Epigloea urosperma*, *Muellerella polyspora*, *Phacographa zwackhii*, *Pronectria pilosa*, *Rhymbocarpus pubescens*, *Taeniolella friesii* and *Unguiculariopsis acrocordiae*.

Non-lichenized fungi new to Russia are *Cyrtidula major*, *Karschia cezannei*, *Kirschsteiniothelia recessa* and *Pseudotryblidium neesii*.

Genera new to Russia are *Andreiomyces*, *Lithothelium*, *Orcularia*, *Phylloblastia*, *Topelia* and *Wadeana*.

Another five lichen species new to Russia have been recently described and our specimens are already published: *Bacidia albogranulosa* (Malíček et al. 2018a), *Biatora radicicola* (Printzen et al. 2016), *Blastenia anatolica* (Vondrák et al. 2019a), *Lecanora stanislai* (Guzow-Krzemińska et al. 2017) and *Lecidea coriacea* (Holien et al. 2016).

The western Caucasian occurrences of some species extend their known range eastwards: e.g., 3000 km from the Iberian Peninsula in *Pronectria pilosa* (López de Silanes et al. 2009), more than 2000 km from the Alps or Italy in case of *Cliostomum haematommatis*, *Endohyalina ericina*, *Leptogium hibernicum*, etc. (Nimis et al. 2018), more than 1300 km from the East Aegean Islands, Greece for *Buellia iberica* (Sipman & Raus 2015) or more than 1000 km from the Carpathians Mts for *Verrucaria hegetschweileri* (Palice et al. 2006). Moreover, the range of *Topelia jasonhurii*, so far known only from its type locality in South Korea (Kondratyuk et al. 2013), was extended of ~ 7000 km.

Ecological aspects

The general characteristics of the observed diversity correspond with data obtained from an altitudinal gradient in Carpathian beech dominated forests (Malíček et al. 2018a, Vondrák et al. 2015, 2018). All plots tend to harbour rare species that characteristically occur in old-growth forests with a long lasting continuity. In contrast, species considered nitrophilous (e.g., frequent European species of Teloschistaceae and Physciaceae) have low species richness and low abundances in all plots which possibly indicates a negligible effect of air pollution caused by emissions of fixed nitrogen.

In plots at low altitudes (below 1000 m), we recorded numerous species and genera characteristic for a warm-humid or oceanic climate (e.g., *Bactrospora dryina*, *Byssoloma leucoblepharum*, *Fellhanera* spp., *Gabura fasciculare*, *Hypotrachyna laevigata*, *H. revoluta*, *Lithothelium* spp., *Maronea constans*, *Myelochroa aurulenta*, *M. metarevoluta*, *Parmotrema perlatum*, *Phylloblastia inexpectata*, *Phyllogyalidea phyllophila*, *Thelotrema lepadinum*, *Topelia jasonhurii* and *Vahliella saubinetii*). In plots at high altitudes, we recorded some typically subalpine species preferring cool-humid climate (e.g., *Anzina carneonivea*, *Caloplaca sorocarpa*, *Parvoplaca tiroliensis*, *Rinodina magelanica* and *Tetramelas chloroleucus*) and boreal species (e.g., *Cetraria sepincola*, *Fuscidea recensa*, *Japewia subaurifera*, *Ptychographa xylographoides* and *Pycnora xanthococca*).

The number of cyanolichen species ranged 15–28 species per plot (total 34 species; Table 1). Although these are seemingly low numbers, they are substantially higher than in ancient forests which were affected by former or present air pollution. For example, old-growth forest plots in the Czech Republic are often without cyanolichens, or only one or few *Peltigera* species are present (Malíček, Palice, Vondrák, unpublished data). A significant decline in cyanolichens is demonstrated for other regions affected by air pollution, e.g. the New Forest in England (Sanderson 2010). Lichens with a trentepohlioid photobiont ranged 15–51 species per plot (total 79 species; Table 1). They were distinctly more represented in plots at low altitudes correspondingly with results by Wolseley et al. (2017) and Vondrák et al. (2018).

Ratio of foliose plus fruticose lichens (macrolichens) versus crustose lichens (microlichens) in our surveyed plots was between 26.5–40% and it rose with altitude. The same trend was observed in the Carpathian forest Uholka, but the range was 20–30% (Vondrák et al. 2018). Positive correlation of macrolichens ratio with altitude may be explained by high demands of macrolichens for humidity and light accessability that both increase with altitude (McCune et al. 1997, Wirth 2010, Bässler et al. 2016).

Substrate specificity and selectivity of epiphytic lichens

Tree bark characteristics greatly influence assemblages of epiphytic lichens (Moning et al. 2009, Nascimbene et al. 2009, Ellis 2012, Király et al. 2013). In our study, the greater species richness was found on silver fir and beech which is not a surprising fact as both tree species are predominant in most plots and both reach the highest trunk dimensions. Rather a high number of species recorded from birch is caused by the birch dominance in the subalpine plot.

Although beech and fir are the most preferred substrata, most lichen species have a low specificity to fir or beech. About 90% of recorded species were observed on three or more types of substrates. Species recorded on less than three types of substrata may be either substrate specific (e.g. *Gyalidea minuta* and *Multiclavula mucida* on logs and snags, and *Stenocybe pullatula* mostly on *Alnus* twigs), or were rarely recorded (e.g. *Cetraria sepincola*, *Lecanora albella*, *Physcia tribacia* and *Usnocetraria oakesiana*). In the latter case, we suggest a lower substrate specificity, which could be tested by extended sampling. Among 223 lichenized species occurring on wood (logs, snags, stumps), only a low portion (56 species) is strictly lignicolous (i.e. restricted to wood); other species were at least occassionally observed on bark/twigs.

Plot 7 – the most diverse lichen flora was found beyond the protected area

The present study is focused on the unique area in the NW Caucasus designated as a UNESCO World Natural Heritage Site “Western Caucasus”. Checklists of lichens from the seven 1-hect-

are forest plots include a high proportion of taxa not previously known from the Caucasus, some even new to Russia. However, the highest species richness (379 species per hectare) was found in the seventh plot which is situated beyond the borderline of the Caucasus Reserve (details in the list of studied sites). The lichenological value of this plot is not only in the large number of species but also in the presence of rare and threatened species. Five species are included in the Red Data Book of the Russian Federation (Trutnev et al. 2008). Among them, *Letharia vulpina*, *Lobaria pulmonaria* and *Usnea florida* are vulnerable (VU), and *Leptogium burnetiae* and *Ricasolia amplissima* are near threatened (NT). The high diversity of lichens in Plot 7 can be explained by its large forest habitat diversity, the high number of tree species and a rugged microrelief with various exposures on limestone bedrock. As it is the most important local hot-spot that we located within our research, we strongly recommend an extension of the Caucasus Reserve to include woodlands beyond its current northern boundary.

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Appendix. GenBank accession numbers and voucher information for sequenced specimens.

Taxon	**Sample**	**ITS**	**mtSSU**
Amandinea sp. (*A.* aff. *punctata*)	J. Vondrák 16429 (PRA)	-	MK778513
Bacidia albogranulosa	J. Vondrák 17113 (PRA)	MK158339	MK158334
Bacidia albogranulosa	J. Malíček 9622 (hb. Malíček)	MK158340	MK158335
Biatora sp. (*B. amylacea* ined.)	J. Malíček 11048 (hb. Malíček)	MK778585	MK778516
Biatora efflorescens	J. Vondrák 16449 (PRA)	MK778586	MK778517
Biatora chrysantha	J. Vondrák 16141 (PRA)	MK778587	-
Biatora pontica	J. Malíček 10212 (hb. Malíček)	MK778588	MK778518
Biatora pontica	J. Vondrák 17846 (PRA)	-	MK778519
Biatora vacciniicola	J. Malíček 10260 (hb. Malíček)	-	MK778520
Blastenia anatolica	Z. Palice 21647 (PRA)	MK778590	-
Blastenia herbidella	J. Vondrák 15529 (PRA)	MK778591	-
Buellia schaereri	J. Vondrák 16109 (PRA)	MK778592	MK778521
Caloplaca turkuensis	J. Vondrák 16059 (PRA)	-	MK778522
Caloplaca turkuensis	J. Vondrák 16131 (PRA)	-	MK778523
Candelariella faginea	J. Malíček 10177 (hb. Malíček)	MK778596	MK778524
Catinaria sp.	J. Malíček 10917 (hb. Malíček)	MK778597	-
Cliostomum haematommatis	J. Malíček 10336 (hb. Malíček)	MK778598	MK778525
Cliostomum haematommatis	J. Malíček 10629 (hb. Malíček)	MK778599	MK778526
Fellhanera sp.	J. Malíček 10523	MK778600	-
Gyalecta herculina	J. Malíček 10203 (hb. Malíček)	MK778584	MK778515
Gyalecta herculina	J. Vondrák 16395 (PRA)	MK778601	-
Gyalectaceae sp.	J. Vondrák 16395 (PRA)	-	MK778527
Lecania croatica	J. Vondrák 16138 (PRA)	MK778602	-
Lecania cf. *cyrtella*	Z. Palice 21641 (PRA)	MK778603	MK778528
Lecania cf. *cyrtella*	G. Urbanavichus s.n. (hb. GU)	-	MK778582
Lecanora allophana	J. Malíček 9626 (hb. Malíček)	KY548050	KY502421
Lecanora argentata	J. Malíček 9620 (hb. Malíček)	MK778604	MK778529
Lecanora barkmaniana	J. Malíček 10602 (hb. Malíček)	MK778605	MK778530

Taxon	Sample	ITS	mtSSU
Lecanora carpinea s.str.	J. Malíček 10364 (hb. Malíček)	MK778606	MK778531
Lecanora carpinea s.str.	J. Vondrák 17820 (PRA)	MK778607	MK778532
Lecanora carpinea s.str.	J. Malíček 11111 (hb. Malíček)	MK778608	MK778533
Lecanora carpinea s.str.	J. Malíček 10681 (hb. Malíček)	-	MK778534
Lecanora cinereofusca	J. Malíček 9621 (hb. Malíček)	-	MK778535
Lecanora exspersa	J. Malíček 9624 (hb. Malíček)	KY548053	KY502420
Lecanora exspersa	J. Malíček 9625 (hb. Malíček)	KY548054	KY502419
Lecanora exspersa	J. Malíček 9629 (hb. Malíček)	KY502415	KY548057
Lecanora exspersa	J. Vondrák 16033 (PRA)	MK778609	MK778536
Lecanora leptyrodes	J. Malíček 10246 (hb. Malíček)	-	MK778537
Lecanora leptyrodes	J. Malíček 10680 (hb. Malíček)	MK778610	MK778538
Lecanora pulicaris	J. Malíček 10262 (hb. Malíček)	MK778611	MK778539
Lecanora pulicaris	J. Malíček 10263 (hb. Malíček)	MK778612	MK778540
Lecanora pulicaris	J. Malíček 11039 (hb. Malíček)	-	MK778541
Lecanora pulicaris	Z. Palice 23005 (PRA)	-	MK778542
Lecanora sp.	J. Malíček 10617 (hb. Malíček)	-	MK778543
Lecanora sp.	J. Malíček 10608 (hb. Malíček)	MG076967	-
Lecanora stanislai	J. Malíček 10367 (hb. Malíček)	-	MK778544
Lecanora stanislai	J. Vondrák 14920 (PRA)	-	MK778545
Lecidea sp.	J. Malíček 10656 (hb. Malíček)	MK778613	MK778546
Lecidella aff. *flavosorediata*	J. Malíček 10904 (hb. Malíček)	MK778614	-
Lecidella flavosorediata	J. Malíček 11114 (hb. Malíček)	MK778615	MK778547
Leptogium burnetiae	J. Vondrák 15904 (PRA)	-	MK778548
Leptogium saturninum	J. Vondrák 15903 (PRA)	-	MK778549
Loxospora cristinae	J. Malíček 10659 (hb. Malíček)	MK778617	MK778550
Loxospora cristinae	J. Malíček 10314 (hb. Malíček)	-	MK778551
Loxospora cristinae	J. Malíček 10954 (hb. Malíček)	-	MK778552
Loxospora cristinae	J. Malíček 10346 (hb. Malíček)	-	MK778553
Loxospora cristinae	J. Vondrák 15538 (PRA)	MK778619	-
Loxospora cristinae	J. Vondrák 15351 (PRA)	MK778620	-
Loxospora cristinae	J. Vondrák 15537 (PRA)	MK778621	MK778554
Marchantiana asserigena	J. Vondrák 16394 (PRA)	MK778593	-
Megalospora porphyritis	J. Vondrák 15146 (PRA)	MK778622	MK778555
Melanelixia epilosa	J. Vondrák 15963 (PRA)	MK778623	MK778556
Micarea nowakii	J. Malíček 10199 (hb. Malíček)	-	MK778557
Micarea nowakii	J. Malíček 11014 (hb. Malíček)	-	MK778558

Taxon	**Sample**	**ITS**	**mtSSU**
Mycobilimbia epixanthoides	J. Vondrák 16494 (PRA)	MK778624	MK778559
Mycoblastus sp.	J. Malíček 10999 (hb. Malíček)	MK778625	MK778560
Ochrolechia pallescens	J. Malíček 10146 (hb. Malíček)	MK778626	MK778561
Ochrolechia trochophora	J. Vondrák 15442 (PRA)	MK778627	MK778562
Parmelia barrenoae	J. Malíček 10740 (hb. Malíček)	MK778628	-
Parmelia ernstiae	J. Malíček 10389 (hb. Malíček)	MK778629	MK778563
Parmelia saxatilis	J. Malíček 10251 (hb. Malíček)	MK778630	MK778564
Parmelia saxatilis	J. Malíček 10209 (hb. Malíček)	MK778631	MK778565
Parmelia saxatilis	J. Vondrák 16148 (PRA)	MK778632	-
Parmelia serrana	J. Malíček 10786 (hb. Malíček)	MK778633	MK778566
Parmelia serrana	J. Malíček 10661 (hb. Malíček)	MK778634	MK778567
Parmelia serrana	J. Malíček 11054 (hb. Malíček)	MK778635	MK778568
Parmelia submontana	J. Vondrák 16549 (PRA)	-	MK778569
Parvoplaca servitiana	J. Vondrák 16132 (PRA)	MK778594	MK778570
Parvoplaca tiroliensis	J. Vondrák 15751 (PRA)	MK778595	-
Pertusaria pupillaris	J. Malíček 11085 (hb. Malíček)	-	MK778571
Physcia cf. *biziana*	J. Malíček 10272 (hb. Malíček)	MK778637	MK778572
Ramalina panizzei	Z. Palice 22766 (PRA)	MK778638	-
Rinodina griseosoralifera	J. Vondrák 16006 (PRA)	-	MK778573
Rinodina malangica	J. Vondrák 15837 (PRA)	-	MK778574
Rinodina sp.	J. Malíček 10238 (hb. Malíček)	MK778639	MK778575
Rinodina sheardii	J. Vondrák 15298 (PRA)	MK778640	-
Rinodina sheardii	J. Vondrák 16540 (PRA)	-	MK778576
Sagedia aff. *mastrucata*	Z. Palice 23193 (PRA)	MK778583	MK778514
Scoliciosporum cf. *umbrinum*	J. Malíček 10228 (hb. Malíček)	MK778641	MK778577
Scoliciosporum sp.	J. Malíček 11023 (hb. Malíček)	MK778642	MK778578
Schaereria corticola	J. Vondrák 16547 (PRA)	-	MK778579
Tetramelas sp.	Z. Palice 23089 (PRA)	MK778643	-
unidentified lichen	J. Vondrák 16151 (PRA)	MK778644	MK778580
Xanthomendoza ulophyllodes	J. Vondrák 16088 (PRA)	MK778645	-
Xylographa parallela	J. Vondrák 15973 (PRA)	MK778636	-
Xylographa parallela	J. Vondrák 15170 (PRA)	MK778589	MK778581
Xylographa parallela	Z. Palice 22099 (PRA)	MK778618	-