New data on lichens from Salair province in Altaisky krai (Siberia, Russia)

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Summary. In terms of lichens, Salair region is the least studied area of Altaisky krai, with as few as five species being reported from the territory, whereas Salair Range within Novosibirsk and Kemerovo regions was well investigated lichenologically. The first data on lichens of Salair province in Altaisky krai are presented: ninety six mostly corticolous and lignicolous lichen species and two non-lichenized fungi traditionally treated with lichens (Phaeocalicium polyporaeum and Schizoxylon albescens) are recorded from Abies sibirica – Populus tremula tall grass forests of Zalesovsky Reserve. Among them, Acrocordia cavata and Phaeocalicium polyporaeum are new records for Siberia. Fusidea pusilla and Bacidina delicata are new for South and West Siberia respectively. Eighteen species are new for Altaisky krai: Absconditella delutula, Arthonia apatetica, Bacidia circumspecta, B. igniarii, B. incompta, B. polychroa, B. subincompta, Biatora efflorescens, Calicium denigratum, Melanelixia fuliginosa ssp. glabratula, Micarea lignaria, Mycobilimbia epixanthoides, Pertusaria hemisphaerica, P. leioplaca, Placynthiella dasaea, Pseudoschismatomma ruforescens, Rinodina efflorescens, and Xanthomendoza fulva. Most recorded species are epiphytes, because the ground is almost completely covered by vegetation dominated by tall grasses and forbs; stones were not found. “Calicioid lichens” – three Calicium and four Chaenotheca species, which are well-known as markers of ecological continuity in forest communities, are relatively diverse and abundant. Several other species, e. g. Absconditella delutula, Acrocordia cavata, Arthonia apatetica, Bacidia spp., Collema furfuraceum, Lobaria pulmonaria, Ramalina spp. are also characteristic for old-growth biologically valuable forests in Altaisky krai. One species – Lobaria pulmonaria – is included in the Red Data Book of Russia, and another species – Ramalina roesleri – in the Red Data Book of Altaisky krai. It is strongly recommended to maintain the special protection regime and exclude felling of the forest in Zalesovsky reserve.
Introduction

Altaiisky krai (Altai Territory) is a large (169,100 km²) administrative area within the Russian Federation, located at the southern part of West Siberia, between 50° and 55°N and 77° and 87°E. The area is situated in the place of a contact of the southeastern part of the West-Siberian Plain and the Altai Mountains. It lies between 79 and 2490 m above sea level. A wide range of vegetation types such as semideserts, steppes, forest-steppes, taiga and high mountain types of vegetation are represented in Altaiisky krai. More than 60 % of plains are ploughed up by agrocommunities.

Altaiisky krai is divided into 8 biogeographical regions (Silantieva, 2006), 7 of which (all apart from the Ob’ bottomland) were accepted by us (Davydov, 2014; see Fig. 1). One of them, Salair region, is situated in the North of Altaiisky krai. Salair Ridge is an eroded plateau-type highland ca. 300 km in length and 15–40 km wide. It is a natural continuation of Altai Mountains separating the Kuznetsk Depression from the Ob’ River Plain. The native vegetation of Salair Ridge is Abies sibirica tall grass forests. Nowadays the territory is mostly covered by the secondary Betula pendula or Populus tremula forests.

The first checklist of lichens, lichenicolous and allied fungi of Altaiisky krai and detailed history of investigations of lichens in the area were published recently (Davydov, 2014; Davydov, Skachko, 2014). The eight regions of Altaiisky krai have received varied attention from lichenologists. The best-studied region is the North-West Altai with 517 recorded lichen species known from the area (see Davydov, 2001, 2004, 2014; Davydov et al., 2007, 2012; Davydov, Printzen, 2012a, b). In contrast, Salair region is the least studied area, with only five species reported from the territory (Davydov, 1999, 2004; Stas’, 1999; Konoreva et al., 2016; Vondrák et al., 2016). At the same time, lichen biota of Salair Range within Novosibirsk and Kemerovo Regions was extensivly investigated (Sedelnikova, 2007; Baumgartner, 2012).

In spite of the fact that lichen biota of some regions is poorly investigated, it is clear that South Siberia is a major center of lichen diversity in North Asia. The main goal of the study is to contribute to the knowledge of lichen diversity in Salair region within Altaiisky krai. The study is based on collections made by the authors in Zalesovsky reserve in 2012 and 2014. The list of taxa includes 98 corticolous and lichicolous species. All reported species are new to the area, except for Gyalolechia ussuriensis, Lobaria pulmonaria, and Mycobilimbia carneoalbida. Among the newly reported species, four are new either to the whole Siberia or to its major geographical subdivisions (Acrocordia cavata, Bacidina delicata, Fuscidea pusilla, and Phaeocalicium polyporaeum), and 18 species new for Altaiisky krai (Absconditella delutula, Arthonia apatetica, Bacidina ssp., Collema furfuraceum, Lobaria pulmonaria, Ramalina spp.,), also characterized by starovozрастные biologically primary forests in the Altai Mountains. One species (Lobaria pulmonaria) is included in the Red Book of Russia, one (Ramalina roesleri) – in the Red Book of Altaiisky krai. The conservation status of forest is still protected.

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Material and methods

Zalesovsky reserve (zakaznik) is situated in the north-eastern part of Altaisky krai in the forest zone of Salair Ridge within the Berd' River basin. The regional climate is strongly continental with a mean annual temperature of +1.7 °C. The minimum temperature is −50 °C, maximum temperature +37 °C, mean temperature of the coldest month (January) ca −17 °C, and that of the warmest month (July) ca +18 °C. The terrain is gently rugged, eroded, with flat and convex watershed areas dissected by a dense network of valleys and small ravines descending down to a depth of 100–200 m. The territory lies 400–600 m above sea level. The main vegetation type is subnemoral Abies sibirica–Populus tremula forests. The undergrowth is represented by Sorbus sibirica and Padus avium, the shrub layer — by Crataegus sanguinea, Viburnum opulus, Ribes spicata, and Rubus idaeus (Fig. 2). The herbaceous layer is well developed consisting of ferns and tall grasses, including Dactylis glomerata and Festuca gigantea, and the forbs Aconitum septentrionale, Angelica decurrens, and Paeonia anomala (Shmakov et al., 2009). Zalesovsky reserve includes relatively small and highly fragmented territories, covering in total about 40–50 km² within the Salair province. Old-growth forests, which have never been cut down, have survived only within the territory of the reserve. These habitats were the focus of the present investigation.

Herbarium specimens were collected by the authors during 2012 and 2014 from the following collecting sites (WGS 84 system was used for geographical GPS coordinates):

1. “Russia, Altaisky krai, Zalesovsky district, Salair Ridge, 20 km NE from the Kordon settlement, headwaters of the Berd' River, alt. 430 m. N54.4167°, E 85.1167°, Abies sibirica–Populus tremula tall grass forest, 29 V 2012, leg. E. A. Davydov, and 12 V 2014, leg. E. A. Davydov, L. A. Konoreva”.

2. “Russia, Altaisky krai, Zalesovsky district, Salair Ridge, 30 km NNE from the Kordon settlement, headwaters of the Pavlovka River (Berd' River's basin), alt. 380 m, N54.4167°, E 85.1500°,

Fig. 1. Biogeographical regions in Altaisky krai (according to Silantieva, 2006, modified). K – Kulunda; LO – Ob’ River Left–bank territory; RO – Ob’ River Right–bank territory; S – Salair and adjacent territories; ARH – Alei River hills; NA – North Altai; NWA – North West Altai. Collecting area is marked with black circle (●). The large-scale map of Zalesovsky reserve is inserted.
Abies sibirica–Populus tremula tall grass forest, 30 V 2012, leg. E. A. Davydov, and 12 V 2014, leg. E. A. Davydov, L. A. Konoreva”.

Samples were collected from the bark of living trees and from dead wood: standing dead trees (snags), fallen logs, branches and stumps. Voucher specimens are deposited in ALTB. Morphological and anatomical characters were analyzed by applying standard methods of light microscopy. Chemical analyses of secondary products were made using standard thin-layer chromatography (TLC) techniques (Culberson, Kristinsson, 1970). Species reported for the first time for Siberia or its major geographical subdivisions are marked with (!!) and for Altaisky krai with (!). Non-lichenized fungi traditionally treated with lichens are marked (+) (this only applies to Phaeocalicium polyporaeum).

The Russian distribution and/or short taxonomic notes are provided only for rare or otherwise interesting species.

Results and discussion

The list includes 98 species collected from the relatively small area which belongs to the Zalesovsky Reserve. Most species are epiphytes, because the ground is almost completely covered by vegetation dominated by tall grasses and forbs; stones were not found. “Calicioid lichens” – three Calicium and four Chaenotheca species, which are well-known markers of ecological continuity in forest communities, are relatively diverse and abundant. Several other species, e. g. Absconditella delutula, Acrocordia cavata, Arthonia apatetica, Bacidia spp., Collema furfuraceum, Lobaria pulmonaria, Ramalina spp. are also characteristic for old-growth biologically valuable forests in Altaisky krai. One species – Lobaria pulmonaria – is included in the Red Data Book of Russia (Istomina, 2008), and another species – Ramalina roesleri – in the Red Data Book of Altaisky krai (Davydov, 2016). It is strongly recommended to maintain its special protection and exclude felling of the forest in the Zalesovsky reserve.

List of species

Absconditella delutula (Nyl.) Coppins & H. Kilias – on bark of Abies sibirica; collecting site: 1, coll. Davydov 10599, Konoreva. 

Russian distribution. Scattered throughout cool temperate regions: North Ural (Hermansson et al., 2006), Russian Plain (Notov et al., 2011; Zhdanov, Volosnova, 2012), Kola Peninsula (Melekhin, 2013), and Leningrad Region (Himelbrant et al., 2015). Additionally, Sedelnikova (2013) listed this species

Fig. 2. Abies sibirica dominated subnemoral tall grass forest in Zalesovsky reserve.
for Siberia without providing precise locality details or reference to herbarium samples.

**Note:** This rare and very inconspicuous species can grow on rotten wood, bark and soil. The thallus forms a glossy, greenish film on the substratum. This species is closely related to *Absconditella lignicola* and differs by its 3-septate ascospores and slightly larger apothecia.

Additional material examined: RUSSIA. Belgorod region, Gubkinsky district, Dolgoe reserve, oak and pine forests, on rotten wood, 2002, Konoreva s. n. (KPABG).

**!! Acrocordia cavata** (Ach.) R. C. Harris – on bark of *Populus tremula*; collecting sites: 1, coll. Davydov 10504, 10808, 10184, Davydov 10523, Konoreva.

**Russian distribution:** North-West Caucasus (Otте, 2005), North-Western European Russia (Stepanchikova et al., 2009; Notov et al., 2011; Tagirdzhanova et al., 2014).

This is a first record for Siberia and a second record for Asia outside the Caucasus.

**Note:** This rare pyrenolichen is characteristic for biologically valuable forests in the Southern Taiga (Andersson et al., 2009) and is included in the Red Data Books of Karelia (2007) and Murmansk region (Konoreva, 2014).

**Amandinea punctata** (Hoffm.) Coppins et Scheid – on bark of *Salix* sp. and *Abies sibirica*; collecting sites: 1, coll. Davydov 10154, Davydov 10505, 10541, Konoreva.

**!! Arthonia apatetica** (A. Massal.) Th. Fr. – on bark of *Salix* sp., collecting site: 2, coll. Davydov 10745.

**Note:** *Arthonia apatetica* is an inconspicuous boreal species with a scattered distribution in Europe and North America (Smith et al., 2009). It is characterized by a granular, green thallus, convex, blackish apothecia, and 1-septate ascospores. It can be distinguished from the closely related species *A. muscigena* and *A. patellulata* by the structure of its paraphyses.

**Arthonia radiata** (Pers.) Ach. – on bark of *Abies sibirica*, *Populus tremula* and *Sorbus sibirica*; collecting sites: 1, 2, coll. Davydov 10737, Davydov 10514, 10545, Konoreva.

**Arthonia ruana** A. Massal. – on bark of *Sorbus sibirica*, collecting site: 1, coll. Davydov 10205.

**Alyxoria varia** (Pers.) Ertz et Tehler – on bark of *Populus tremula*; collecting sites: 1, 2; coll. Davydov 10185, Davydov 10564, Konoreva.

**Athallia pyracea** (Ach.) Arup, Frödén et Sochting (syn. *Caloplaca pyracea* (Ach.) Th. Fr.) – on bark of *Populus tremula*; collecting site: 2, coll. Davydov 10552, Konoreva.

**!! Bacidia circumspecta** (Norrl. et Nyl.) Malme – on bark of *Populus tremula*; collecting site: 2, coll. Davydov 11288, Konoreva.

**Russian distribution:** Karelia and Komi Republics, Leningrad, Ulyanovsk regions (Golubkova, 2003), Caucasus (Urbanavichus, 2010), Omsk region (Golubkova, 2003), Novosibirsk region (Sedelnikova, 2007), Primorskiy krai (Galanina, Yakovchenko, 2007), Amur region (Golubkova, 2003).

**Note:** It is morphologically similar to *B. ignarii*, but differs in having 3–6 septate ascospores.

**Bacidia fraxinea** Lönnr. – on bark of *Populus tremula*; collecting site: 1, coll. Davydov 10597, 10598, Konoreva.

**!! Bacidia igniarii** (Nyl.) Oxner – on bark of *Abies sibirica*; collecting site: 1, coll. Davydov 10181.

**!! Bacidia incompta** (Borr.) Anzi – on bark of *Abies sibirica*; collecting site: 2, coll. Davydov 10165.

**Note:** This rare circumboreal species is characterized by having a thin, granular to verrucose thallus, black apothecia, with a thin margin, bacilliform to acicular ascospores and dark-brown hypothecium.

**Bacidia polychroa** (Th. Fr.) Körb. – on bark of *Populus tremula*; collecting site: 1, coll. Davydov 11290.

**!! Bacidia subincompta** (Nyl.) Arnold – on bark of *Sorbus sibirica* and *Caragana arborescens*; collecting site: 2, coll. Davydov 10203, Davydov 11289, Konoreva.

**Note:** A common species in old woodlands as well as secondary forests in many countries, occasionally occurring in open habitats from Arctic to the steppe zone. The species was recorded for Novosibirsk region (Sedelnikova, 2007), but probably overlooked in Altaiisky krai.

**!! Bacidina delicata** (Larbal. ex Leight.) V. Wirth et Vězda – on bark of *Populus tremula* and *Abies
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**sibirica**; collecting sites: 2, coll. Davydov 10593, Konoreva.

**Russian distribution**: Belgorod region (Konoreva, Muchnik, 2005), European part of Russia (Muchnik, 2005; Notov et al., 2011), Caucasus (Isailov, Urbanavichus, 2013), and East Siberia (Urbanavichene, Urbanavichus, 2009).

**Note**: Not rare, but an often overlooked, boreal species, with a wide-spreading, pale green leprose thallus and small, pale-pink apothecia with thinly needle-shaped, 3–7 septate ascospores. This is a new record for West Siberia.

**Biatora chrysantha** (Zahlbr.) Printzen – on bark of *Abies sibirica*; collecting sites: 1, 2, coll. Davydov 11252, 11254.

**TLC**: gyrophoric acid.

**Biatora efflorescens** (Hedl.) Räsänen – on bark of *Populus tremula*; collecting site: 1, coll. Davydov 10144.

**TLC**: argopsin.

**Note**: Not rare, though usually occurring in a sterile form. The species is similar to *B. chrysantha*. The latter, however, differs from *B. efflorescens* in having a yellowish thallus containing gyrophoric acid (Printzen, 1995).

**Bryoria capillaris** (Ach.) Brodo et D. Hawskw. – on bark of trunks and branches of *Abies sibirica*; collecting site: 3, coll. Davydov 10144.

**Calicium viride** Pers. – on bark of *Abies sibirica*; collecting sites: 1, 2, coll. Davydov 10192, Davydov 10583, Konoreva.

**Caloplaca cerina** (Ehrh.) Th. Fr. – on bark of *Populus tremula*, collecting site: 1, 2, coll. Davydov 10095, Davydov 10551, Konoreva.

**Caloplaca pyracea** (Ach.) Th. Fr. – on bark of *Populus tremula*, collecting site: 2, coll. Davydov 10552, Konoreva.

**Catillaria nigroclavata** (Nyl.) Schul. – on bark of *Betula pendula*; collecting site: 4, coll. Davydov 10563, Konoreva.

**Chaenotheca chrysocephala** (Turn.) Th. Fr. – on bark of *Abies sibirica*; collecting site: 1, 3, coll. Davydov 10127, 10795.

**Chaenotheca furfuracea** (L.) Tibell – on bark of *Abies sibirica*, stump of *Betula* sp. and tree roots, collecting site: 2, coll. Davydov 10183, 10196, Davydov 10531, Konoreva.

**Chaenotheca stemonea** (Ach.) Müll. Arg. – on bark of old *Abies sibirica*; collecting site: 3, coll. Davydov 10197.

**Chaenotheca trichialis** (Ach.) Th. Fr. – on bark of *Abies sibirica* and *Picea obovata*; collecting sites: 1, 2, coll. Davydov 10195, 10270, 10796, Davydov 10542, Konoreva.

**Cladonia coniocraea** (Fr.) Mudd – on bark of *Abies sibirica*, *Picea obovata* on stump, dry tree, open canopy woodlands on the Plains and in forest belt of Mountains (McMullin et al., 2012).

**Cladonia chlorophaca** (Flörke) Spreng. s. l. – on bark of *Picea obovata* and wood, collecting site: 1, coll. Davydov 10508, 10543, 10558, Konoreva.
log, wood; collecting site: 2, coll. Davydov 10507, 10511, 10512, 10529, 10559, 10566, 10600, Konoreva.

Cladonia fimbriata (L.) Fr. – on dry tree, stump, log; collecting sites: 2, coll. Davydov 10537, 10538, 10567, Konoreva.

Collema furfuraceum (Arnold) Du Rietz em. Degel. – on bark of Populus tremula; collecting site: 1, coll. Davydov 10104, 10115.

Evernia divaricata (L.) Ach. – on bark and branches of Abies sibirica; collecting sites: 1, 3, coll. Davydov 10124, 10140, 10157, 10186.

Evernia mesomorpha Nyl. – on bark of dry Abies sibirica, Salix sp.; collecting sites: 1, 3, coll. Davydov 10150, 10178.

Fuscidea pusilla Tønsberg – on dry tree; collecting site: 2, coll. Davydov 10603, Konoreva.

Russian distribution: Leningrad region, Karelia, Ural Mts., and West Siberia (Makarova, 2004; Muchnik et al., 2009; Urbanavichus, 2010; Paukov, Teptina, 2013). This is a new record for South Siberia.

TLc: divaricatic acid.

Note: This species is characterized by having small dark-green circular thalli with a blackish hypothallus, initially well-separated soralia, later coalescing and the presence of divaricatic acid.

Gyalolechia ussuriensis (Oxner et al.) Vondrák (Syn. Caloplaca ussuriensis Oxner et al.) – on bark of Populus tremula, collecting site: 1, coll. Davydov 11220.

Russian distribution: The species was previously reported from the area by Vondrák et al. (2016). Additionally, the species was recorded from Sayan Mountains and Far East – Sikhote-Alin Ridge and Kamchatka (ibid).

Note: The species is characterized by having a thick, distinctly cracked thallus with yellow soralia, apothecia 0.5–1 mm diam. with brown to dark brown disc and broadly ellipsoid to almost spherical ascospores. This species is closely related to Caloplaca oxneri has been recently described from Russian Far East (Kondratyuk et al., 2011) and is associated with humid taiga forests from Siberia and the Far East.

Hypogymnia physodes (L.) Nyl. – on bark and branches of Abies sibirica; collecting site: 1, 2; coll. Davydov 10158, 10572, 10180; Davydov 10595, Konoreva.

Hypogymnia tubulosa (Schaer.) Hav. – on branches of Abies sibirica; collecting site: 1, coll. Davydov 10574, Konoreva.

Japewia tornøënsis (Nyl.) Tønsberg – on branches of Abies sibirica; collecting site: 2, coll. Davydov 10143.

Lecania cyrtella (Ach.) Th. Fr. – on bark of Salix sp.; collecting site: 2, coll. Davydov 10744.

Lecanora allophana Nyl. – on bark of Populus tremula; collecting site: 1, coll. Davydov 10201; 10114; 10145.

Lecanora argentata (Ach.) Malme – on bark of Populus tremula, on log (Abies sibirica); collecting sites: 1, 2, coll. Davydov 10521, 10527, 10592, Konoreva.

Lecanora chlorotera Nyl. – on bark of Abies sibirica, on dry branches; collecting sites: 1, coll. Davydov 10162; Davydov 10565, Konoreva.

Lecanora symmicta (Ach.) Ach. – on bark of Salix sp., on bark and branches of Abies sibirica; collecting sites: 1, 2, coll. Davydov 10153; Davydov 11262; Davydov 10515, Konoreva; Davydov 10141, Davydov 10166.

Lecidella elaeochroma (Ach.) Choisy – on bark and branches of Abies sibirica, on bark of Sorbus sibirica; collecting site: 1, coll. Davydov 10161, Davydov 10561, Davydov 10580, Konoreva.

Lecidella euphorea (Flörke) Hertel – on bark of Populus tremula, on branches of Abies sibirica; collecting site: 1, coll. Davydov 10113; Davydov 10202; Davydov 10518, Konoreva.

Lepidium saturninum (Dicks.) Nyl. – on bark of dry Abies sibirica; collecting site: 1, coll. Davydov 10532, Konoreva.

Lobaria pulmonaria (L.) Hoffm. – on bark of Betula pendula, Salix sp., dry tree; collecting site: 1, coll. Davydov 10110; Davydov 10123; Davydov 10519, Konoreva.

The species has been previously reported from the area by Davydov (1999). Lobaria pulmonaria is
Megaspora verrucosa  (Ach.) Hafellner et V. Wirth – on bark of *Populus tremula*, collecting site: 1, coll. Davydov 10785.

Melanohalea septentrionalis (Lynge) O. Blanco et al. – on bark of *Salix* sp., collecting site: 1, coll. Davydov 10152.

Melanelixia fuliginosa (Fr. ex Duby) Essl. subsp. glabratula Lamy – on bark of *Sorbus sibirica*; collecting site: 1, coll. Davydov 10112.

Melanelixia subaurifera (Nyl.) O. Blanco et al. – on branches of *Abies sibirica*; collecting site: 1, coll. Davydov 10118.

Micarea lignaria (Ach.) Hedl. – on wood; collecting site: 1, coll. Davydov 10122.

Micarea prasina s. l. – on bark of *Abies sibirica*; collecting site: 2, coll. Davydov 10125.

Mycobilimbia carneoalbida (Müll. Arg.) S. Ekman et Printzen – at the base of a trunk of *Populus tremula*; collecting site: 1, coll. Davydov 10173.

The species has been previously reported from the area by Davydov (2004).

Mycobilimbia epixanthoides (Nyl.) Vitik. et al. – at the base of a trunk of *Populus tremula*; collecting sites: 1, coll. Davydov 10174.

Mycobilimbia tetramera (De Not.) Vitik. et al. – at the base of a trunk of *Populus tremula*, collecting site: 1, coll. Davydov 10172.

Ochrolechia pallescens (L.) A. Massal. – on bark of *Sorbus sibirica*, collecting site: 1, coll. Davydov 10167.

Parmelia sulcata Taylor – on bark and branches of *Abies sibirica*, on bark of *Populus tremula*, *Sorbus sibirica*, *Salix* sp. on stump; collecting sites: 1, 2, coll. Davydov 10194, 10146, 10151, 10169, 10111, 10179; Davydov 10525, 10560, 10573; 10594, Konoreva.

Parmeliopsis ambiguа (Wulfen) Nyl. – on bark of *Abies sibirica*; collecting site: 1, coll. Davydov 10506, Konoreva.

Peltigera didactyla (With.) J. R. Laundon – on mosses over log; collecting site: 1, coll. Davydov 10535, Konoreva.

Peltigera polydactylon (Neck.) Hoffm. – on log (Abies sibirica), wood of stump; collecting sites: 1, 2, coll. Davydov 10107; Davydov 10510, 10520, 10540, 10503, Konoreva.

Peltigera praetextata (Flörke) Vain. – on log; collecting sites: 1, coll. Davydov 10130, Davydov 10536, Konoreva.

Pertusaria albescens (Huds.) M. Choisy et Werner – on bark of *Sorbus sibirica*; collecting site: 1, 2, coll. Davydov 10168; Davydov 10171.

Pertusaria amara (Ach.) Nyl. – on bark and branches of *Abies sibirica*; collecting site: 1, coll. Davydov 10159, 10164; Davydov 10568, Konoreva.

Pertusaria hemisphaerica (Flörke) Erichsen – on wood; collecting site: 1, coll. Davydov 11255.

TLC: lecanoric acid.

Pertusaria leioplaca DC. – on bark of *Sorbus sibirica*; collecting site: 1, coll. Davydov 10007.

Note: A circumboreal species closely related to *P. alpina* Hepp but differs in its 4-spored asci.

Pertusaria polyporaeum (Nyl.) Tibell – on Polypore fungi; collecting site: 2, coll. Davydov 10105, Konoreva.

Russian distribution: A boreal species with a scattered distribution; common in humid lowland forests in Caucasus, Far East of Asia, and in North America, relatively rare in Europe, recorded in Romania (*locus classicus*) and the north of European Russia (Titov, 2006). This is a new record for Siberia.

Note: The species is characterized by having 2-celulled hyaline ascospores and its specialised substrate – polypore fungi.

Phaeophyscia ciliata (Hoffm.) Moberg – on bark of *Populus tremula*; collecting site: 1, coll. Davydov 10554, Konoreva.

Phaeophyscia hispidula (Ach.) Essl. – on bark of *Populus tremula*; collecting site: 1, Davydov 10149.

Phaeophyscia nigricans (Flörke) Moberg – on bark of *Populus tremula*; collecting site: 1, coll. Davydov 10118.
**Phaeophyscia orbicularis** (Necker) Moberg – on bark of *Populus tremula*; collecting site: 1, coll. Davydov 10148.

**Phlyctis argena** (Spreng.) Flot. – on bark of *Populus tremula, Picea obovata, Sorbus sibirica, Salix sp.*, on branches of *Abies sibirica*; collecting sites: 1, 2, coll. Davydov 10147, 10170, 10189, 10528; Davydov 10569, Konoreva.

**Physcia aipolia** (Ehrh. ex Humb.) Furnr. – on bark of *Populus tremula*, collecting sites: 1, coll. Davydov 10116; Davydov 10553, Konoreva.

**Physconia distorta** (With.) J. R. Laundon. – on bark of *Populus tremula*; collecting sites: 1, coll. Davydov 10117; Davydov 10501, Konoreva.

**Physconia enteroxantha** (Nyl.) Poelt – on bark of *Abies sibirica*, collecting site: 1, coll. Davydov 10533.

**Placynthiella dasaea** (Stirt.) Tønsberg – on wood; collecting site: 1, coll. Davydov 10602, Konoreva.

**Pseudoschismatomma rufescens** (Pers.) Ertz et Tehler – on bark of *Populus tremula, Picea obovata, Sorbus sibirica, Salix sp.*, on branches of *Abies sibirica*; collecting sites: 1, 2, coll. Davydov 10106, 10108, 10137, 10190, 10199.

**Ramalina farinacea** (L.) Ach. – on bark of *Populus tremula, Sorbus sibirica, Salix sp.*, on branches of *Picea obovata*; collecting site: 1, 2, coll. Davydov 10106, 10108, 10137, 10190, 10199.

**Ramalina obtusata** (Ach.) Bitt. – on bark and branches of *Abies sibirica*, on bark of *Betula pendula*; collecting sites: 1, 2, coll. Davydov 10139, 10160, 10182, 10198.

**Ramalina roesleri** (Hochst.) Nyl. – on bark of *Populus tremula, Sorbus sibirica*, collecting sites: 1, 2, coll. Davydov 10109, 10200; Davydov 10524, Konoreva.

**Ramalina thrausta** (Ach.) Nyl. – on branches of *Abies sibirica*, collecting site: 2, coll. Davydov 10138.

**Rinodina efflorescens** Malme – on bark of *Betula pendula*; collecting sites: 1, coll. Davydov 11283.

**Placynthiella dasaea** (Stirt.) Tønsberg – on wood; collecting site: 1, coll. Davydov 10602, Konoreva.

**Rinodina septentrionalis** Malme – on bark of *Abies sibirica*, collecting site: 1, coll. Davydov 10193.

**Schizoxylon albescens** Gilenstam et al. – on dry branch of *Populus tremula*; collecting site: 1, Davydov 10601, Konoreva.

**Scoliciosporum chlorococcum** (Graewe ex Stearn.) Vězda – on bark of *Abies sibirica*; collecting site: 1, Davydov 10191.

**Tetramelas insignis** (Nägeli ex Hepp) Kalb – on bark of *Abies sibirica*; collecting site: 2, coll. Davydov 10204.

**Trapeliopsis flexuosa** (Fr.) Coppins et P. James – on bark of *Abies sibirica*; collecting site: 1, coll. Davydov 10596, Konoreva.

**Usnea dasypoga** (Ach.) Nyl. – on *Abies sibirica* trunk and branches; collecting site: 1, 2, coll. Davydov s. n.

**Usnea fulvoreagens** (Räsänen) Räsänen – on *Abies sibirica* trunk and branches; collecting site: 1, 2, coll. Davydov s. n.

**Usnea subfloridana** Stirt. – on *Abies sibirica* trunk and branches; collecting site: 1, 2, coll. Davydov s. n.

**Vulpicida pinastri** (Scop.) J.-E. Mattson et M. J. Lai – on stump; collecting site: 1, coll. Davydov 10530, Konoreva.

**Xanthomendoza fulva** (Hoffm.) Sochting et al. – on bark of *Populus tremula*; collecting site: 1, Davydov 10119.
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