

Lichenicolous fungi from Kodar Range, Trans-Baikal Territory of Russia

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Abstract: Sixty three species of lichenicolous and allied fungi are reported, 47 of which are new to Trans-Baikal Territory of Russia. A presumably undescribed *Llimoniella*-like discomycete on *Protoblastenia terricola* is illustrated and discussed. *Plectocarpon melanohaleae* is first recorded in the northern hemisphere. *Diplolaeviopsis ranula*, *Endococcus alectoriae*, *E. verrucisporus*, *Epigloea filifera*, *Sagediopsis fissurisedens* and *Talpapellis peltigerae* var. *peltigerae* are new to Russia and Asia. *Endococcus macrosporus* is new to Russia. *Lichenostigma rupicola*, *Opegrapha geographicola* and *Unguiculariopsis lettaui* are new to Siberia. *Arthonia molendoi*, *Dactylospora glaucomarioides*, *Didymocyrtis consimilis*, *Epibryon conductrix*, *Muellerella lichenicola*, *Phaeospora* cf. *rimosicola*, *Sagediopsis aspiciiliae*, *S. pertusariicola*, *Sphaerellothecium contextum*, *Stigmidium conspurcans*, *S. mitchellii*, *S. solorinarium* and *Talpapellis peltigerae* are new to South Siberia. *Cercidospora thammoliae* and *Sagediopsis pertusariicola* are first reported outside the Arctic. *Athallia* is a new host genus for *Didymocyrtis consimilis* and *Bryoria* for *Endococcus alectoriae*. The following new host species are registered: *Pertusaria geminipara* for *Dactylospora diminuta*, *Calvitimela talayana* for *Endococcus propinquus* s. l., *Bryoria simplicior* for *Lichenostigma maureri* and *Melanohalea olivacea* for *Plectocarpon melanohaleae*.

Keywords: lichen-inhabiting fungi, biogeography, taxonomy, ecology, Stanovoe Upland, South Siberia

INTRODUCTION

This paper presents the results of a revision of lichenicolous fungi collected during the study of lichen flora of Kodar Range located in South Siberia. Lichenicolous fungi of this part of Siberia have been specifically treated in several publications (Zhurbenko & Davydov, 2000; Zhurbenko & Otnyukova, 2001; Zhurbenko & Yakovchenko, 2014), but still remain insufficiently revealed, as evidenced by many biogeographic novelties documented in this article.

Kodar is one of the highest ranges of Stanovoe Upland located in South Siberia to the northeast of Baikal Lake (Fig. 1) within 56–58° N and 115–119° E (Kulakov et al., 2002). Its central peaks mainly rise to the heights of 2700–2800 m. The climate of Kodar is sharply continental with long cold winter and short cool summer. The mean annual air temperature ranges from –5 °C below to –12 °C above. The mean temperature of the warmest month (July) ranges from +2 °C to +16 °C, while the mean temperature of the coldest month (January) ranges from –30 °C

to –40 °C. The mean annual precipitation is 350–1200 mm. The vegetation strongly reflects a vertical zonation caused by the mountainous terrain and forms three altitudinal belts. Forest belt is mainly dominated by *Larix gmelinii*, the other common trees are *Abies sibirica*, *Betula platyphylla*, *B. lanata*, *Chosenia arbutifolia*, *Picea obovata*, *Pinus sibirica*, *P. sylvestris*,



Fig. 1. Location of the study area in Russia.

Populus suaveolens and *P. tremula*. Subalpine belt is mainly composed of sparse *Larix gmelinii* forests and *Pinus pumila*, *Betula divaricata* and *Rhododendron aureum* shrubs interspersed with *Duschekia fruticosa* and *Salix* spp. thickets. Alpine belt is dominated by lichen tundras combined with a patchy plant cover and stone fields mostly inhabited by crustaceous lichens.

MATERIAL AND METHODS

The study is based on 124 specimens of lichenicolous fungi which are deposited in LE and VLA (one specimen) herbaria. The material was examined with standard microscopic techniques using dissecting microscope Stemi 2000-CS and compound microscope Axio Imager A1 equipped with Nomarski differential interference contrast optics (DIC). Microscopic examination was done in water, 10% KOH (K), Lugol's iodine, directly (I) or after a KOH pre-treatment (K/I), or Brilliant Cresyl blue (BCr). Measurements were taken from water mounts, unless otherwise indicated. The length, breadth and length/breadth ratio (l/b) of ascospores and conidia are given (where $n > 10$) as (minimum)–{X–SD}–{X+SD}–(maximum), where X is the arithmetic mean, and SD the corresponding standard deviation, followed by the number of measurements.

THE SPECIES

All collections are from Kodar Range of Stanovoe Upland in South Siberia administratively belonging to the Kalarskii District of Trans-Baikal Territory of Russia. Species new to Trans-Baikal Territory are denoted by an asterisk *.

ABROTHALLUS BERTIANUS De Not. s. l. – Anarga River, 56°55'11" N, 118°01'45" E, elev. 941 m, mixed forest, on *Melanelixia glabratula* (thallus), 9.07.2013, L. A. Konoreva (LE 309219); same river, 56°55'19" N, 118°01'50" E, elev. 1071 m, mixed forest, on *Melanohalea olivacea* (apothecia, thallus), 9.07.2013, Yu. V. Gerasimova (LE 309351a; teleomorph and anamorph).

Notes – Apothecia subglobose and somewhat applanate, constricted at the base, up to 400 μm diam., sometimes slightly pruinose. Epithymenium medium brown to partly purple, with large orange granules dissolving in K, K+ olive green. Hymenium colourless to partly purple, K+ greenish. Hypothecium medium gray brown/

brown, K+ olive. Ascospores pale to medium olive gray/yellowish brown, distinctly verrucose, (11.2–)11.5–14.9(–19.5) \times (4.1–)4.7–5.9(–7.7) μm , l/b = (2.1–)2.2–2.8(–3.5) ($n = 40$, LE 309219) or (11.7–)12.6–15.6(–19.5) \times (4.6–)4.9–6.3(–8.5) μm , l/b = (1.9–)2.1–2.9(–3.5) ($n = 71$, LE 309351a), (0–)1-septate, not to occasionally markedly constricted at the septum, occasionally with halo ca. 1 μm thick (better seen in K). Conidia (7.7–)8.4–11.4(–12.8) \times (3.6–)3.9–4.7(–5.0) μm , l/b = (1.5–)1.9–2.9(–3.6) ($n = 25$, observed only in LE 309351a).

The type of *Abrothallus bertianus* is confined to species of *Melanelixia* (Lawrey & Diederich, 2016; P. Diederich, pers. comm.), however, the fungus has also been reported from species of *Melanohalea* (Santesson, 1960; Hafellner & Wieser, 2000; Suija, 2005; Alstrup & Ahti, 2007; Brackel, 2011). It is noteworthy that the examined specimens on *Melanelixia* and *Melanohalea* clearly differ in size of their ascospores.

*ABROTHALLUS PARMELIARUM (Sommerf.) Arnold – Shan'go River, 56°57'31" N, 117°48'13" E, elev. 1715 m, subalpine *Larix gmelinii* thin forest, on *Parmelia omphalodes* (thallus), 9.06.2014, S. V. Chesnokov (LE 309220); Syul'ban River, 56°50'41" N, 117°17'57" E, elev. 1381 m, *Chosenia arbutifolia* forest, on *P. sulcata* (thallus), 13.06.2015, S. V. Chesnokov (LE 309322a); 56°40'12" N, 117°10'38" E, elev. 1054 m, mixed forest, on *P. sulcata* (thallus), 23.06.2015, S. V. Chesnokov (LE 309343).

ABROTHALLUS PEYRITSCHII (Stein) Kotte – Anarga River, 56°55'19" N, 118°01'50" E, elev. 1071 m, mixed forest, on *Vulpicida pinastri* (thallus), 9.07.2013, Yu. V. Gerasimova (LE 309250c; anamorph); Syul'ban River, 56°40'12" N, 117°10'38" E, elev. 1054 m, mixed forest, on *V. pinastri* (thallus), 23.06.2015, S. V. Chesnokov (LE 309217).

Notes – Diederich (2004) characterized the hymenium of the species as hyaline to pale brownish, pale green in the upper part, but in the examined specimen it is purple. Conidia (5.4–)5.7–7.1(–8.5) \times (4.3–)4.4–5.2(–6.5) μm , l/b = 1.2–1.4(–1.7) ($n = 35$).

*ARTHONIA CLEMENS (Tul.) Th. Fr. – Shan'go Lake, 56°58'41" N, 117°47'50" E, elev. 1908 m, mountain tundra, on *Rhizoplaca chrysoleuca* (apothecial discs), 7.06.2014, S. V. Chesnokov (LE 309242); headwaters of Shan'go River,

56°58'34" N, 117°49'12" E, elev. 1992 m, mountain tundra, on *R. chrysoleuca* (discs of apothecia), 8.06.2014, L. A. Konoreva (LE 309329).

*ARTHONIA DIGITATAE Hafellner – Uglovoi Creek, 56°56'39" N, 117°36'44" E, elev. 1691 m, mountain tundra, on *Cladonia pyxidata* (basal squamules), 16.06.2014, L. A. Konoreva (LE 309328).

*ARTHONIA MOLENDI (Frauenf.) R. Sant. – Olenii Rog Creek, 56°47'57" N, 117°21'59" E, elev. 1674 m, subalpine *Pinus pumila* shrubs, on *Polycaulonia polycarpa* (apothecia, thallus), 18.05.2015, L. A. Konoreva (LE 309334).

Note – New to South Siberia.

ARTHONIA STEREOCAULINA (Ohlert) R. Sant. – Mramornoe gorge, Mramornyi settlement, 56°54'38" N, 117°42'29" E, elev. 1806 m, stone field, on *Stereocaulon* sp. (phyllocladia, apothecia), 3.07.2013, L. A. Konoreva (LE 309358a); Surpriznoe Lake, 56°54'21" N, 117°38'20" E, elev. 2011 m, mountain tundra, on *S. vesuvianum* (phyllocladia), 5.07.2013, L. A. Konoreva (LE 309276b); headwaters of Shan'go River, 56°58'39" N, 117°49'08" E, elev. 2063 m, boulder field, on *S. botryosum* (phyllocladia), 8.06.2014, S. V. Chesnokov (LE 309355a); Shan'go River, 56°57'31" N, 117°48'13" E, elev. 1715 m, subalpine *Larix gmelinii* thin forest, on *Stereocaulon* sp. (phyllocladia), 9.06.2014, L. A. Konoreva (LE 309325); Azarova glacier, 56°53'58" N, 117°34'59" E, elev. 2053 m, mountain tundra, on *S. symphycheilum* (phyllocladia, stems), 13.06.2014, S. V. Chesnokov (LE 309362); confluence of Uglovoi Creek and Srednii Sakukan River, 56°56'33" N, 117°36'51" E, elev. 1670 m, mountain tundra, on *Stereocaulon* sp. (phyllocladia), 15.06.2014, S. V. Chesnokov (LE 309218b); confluence of Syul'ban River and Zolotoi Creek, 56°50'12" N, 117°17'23" E, elev. 1627 m, subalpine *Pinus pumila* shrubs, on *S. rivulorum* (phyllocladia), 14.06.2015, S. V. Chesnokov (LE 309216a).

*CARBONEA VITELLINARIA (Nyl.) Hertel – Uglovoe Lake, 56°56'52" N, 117°35'43" E, elev. 1892 m, mountain tundra, on *Candelariella vitellina* (thallus), 17.06.2014, S. V. Chesnokov (VLA).

*CATILLARIA STEREOCAULORUM (Th. Fr.) H. Olivier – Leprindinskoe Plateau, 56°40'05" N, 117°24'50" E, elev. 2142 m, mountain tundra, on *Stereocaulon rivulorum* (phyllocladia), 15.08.2012, L. A. Konoreva (LE 309232); Zolotoi Creek,

56°55'57" N, 117°36'51" E, elev. 1857 m, rocks in mountain tundra, on *S. lambii* (phyllocladia), 6.07.2013, M. P. Andreev (LE 309357); Azarova glacier, 56°53'58" N, 117°34'59" E, elev. 2053 m, mountain tundra, on *S. rivulorum* (phyllocladia), 13.06.2014, S. V. Chesnokov (LE 309344); Srednii Sakukan River, 56°56'28" N, 117°36'55" E, elev. 1686 m, subalpine *Salix* shrubs, on *S. rivulorum* (phyllocladia), 18.06.2014, S. V. Chesnokov (LE 309235); Syul'ban River, 56°53'17" N, 117°18'48" E, elev. 1562 m, subalpine *Larix gmelinii* thin forest, on *S. cf. subcoralloides* (phyllocladia), 10.06.2015, S. V. Chesnokov (LE 309365); confluence of Syul'ban River and Zolotoi Creek, 56°50'12" N, 117°17'25" E, elev. 1595 m, subalpine *Pinus pumila* shrubs, on *S. rivulorum* (phyllocladia), 14.06.2015, S. V. Chesnokov (LE 309233, LE 309216b); Olenii Rog Creek, 56°47'57" N, 117°21'59" E, elev. 1674 m, subalpine *Pinus pumila* shrubs, on *S. rivulorum* (phyllocladia), 18.06.2015, S. V. Chesnokov (LE 309234).

*CERCIDOSPORA PUNCTILLATA (Nyl.) R. Sant. – Uglovoe Lake, 56°56'41" N, 117°35'12" E, elev. 1918 m, mountain tundra, on *Solorina crocea* (mori-bund thallus), 17.06.2014, S. V. Chesnokov (LE 309321b).

CERCIDOSPORA STEREOCAULORUM (Arnold) Hafellner – Leprindinskoe Plateau, 56°40'00" N, 117°24'52" E, elev. 2042 m, mountain tundra, on *Stereocaulon condensatum* (cephalodia, phyllocladia, stems), 15.08.2012, M. P. Andreev (LE 309364); Medvezhii Creek, 56°54'35" N, 117°36'42" E, elev. 1796 m, stone field, on *S. vesuvianum* (phyllocladia), 1.07.2013, M. P. Andreev (LE 309354); Zolotoi Creek, 56°56'05" N, 117°37'18" E, elev. 1680 m, mountain tundra, on *S. glareosum* (cephalodia, phyllocladia, stems), 6.07.2013, M. P. Andreev (LE 309361); same creek, 56°55'57" N, 117°36'51" E, elev. 1857 m, mountain tundra, on *S. symphycheilum* (phyllocladia), 6.07.2013, L. A. Konoreva (LE 309360); Shan'go River, 56°57'31" N, 117°48'13" E, elev. 1715 m, subalpine *Larix gmelinii* thin forest, on *S. condensatum* (phyllocladia), 9.06.2014, L. A. Konoreva (LE 309331a); Azarova glacier, 56°53'58" N, 117°34'59" E, elev. 2053 m, mountain tundra, on *S. lambii* (phyllocladia), 13.06.2014, S. V. Chesnokov (LE 309356a); Uglovoi Creek, 56°56'55" N, 117°36'12" E, elev. 1735 m, rocks, on *S. subcoralloides* (phyllocladia), 17.06.2014, L. A. Konoreva (LE 309363).

*CERCIDOSPORA THAMNOLIAE Zhurb. – Baltiiskoe gorge, 56°54'20" N, 117°39'21" E, elev. 1903 m, mountain tundra, on *Thamnolia vermicularis* (thallus), 2.07.2013, L. A. Konoreva (LE 309222).
Note – Formerly known only from the Arctic (Zhurbenko, 2012).

*DACTYLOSPORA AMYGDALARIAE Triebel – Uglovoi Creek, 56°56'39" N, 117°36'44" E, elev. 1691 m, mountain tundra, on *Amygdalaria panaeola* (cephalodia, thallus), 16.06.2014, L. A. Konoreva (LE 309316); Olenii Rog Creek, 56°47'41" N, 117°22'17" E, elev. 1888 m, mountain tundra, on *A. elegantior* (thallus), 18.06.2015, S. V. Chesnokov (LE 309342).

*DACTYLOSPORA DEMINUTA (Th. Fr.) Triebel – Mramornoe gorge, 56°54'18" N, 117°42'33" E, elev. 1885 m, mountain tundra, on *Pertusaria geminipara* (thallus), 3.07.2013, L. A. Konoreva (LE 309228); confluence of Uglovoi Creek and Srednii Sakukan River, 56°56'31" N, 117°36'50" E, elev. 1690 m, subalpine *Salix* shrubs, on *Biatora cf. vernalis* (thallus), 15.06.2014, L. A. Konoreva (LE 309339); headwaters of Olenii Rog Creek, 56°48'31" N, 117°24'53" E, elev. 1971 m, mountain tundra, on *Pertusaria geminipara* (thallus), 16.06.2015, L. A. Konoreva (LE 309243).

Notes – Hymenium hyaline to light reddish brown, exciple and hypothecium strongly reddish brown to brown, violet blue granules not observed. Ascospores (12–)14.1–20.1(–24.0) × (4.5–)5.1–6.3(–7.0) μm, l/b = (2.0–)2.4–3.6(–4.8) (n = 39), with (1–)3(–7) transsepta.

Pertusaria geminipara is a new host species.

*DACTYLOSPORA GLAUCOMARIOIDES (Tuck.) Hafellner – Olenii Rog Creek, 56°48'13" N, 117°24'16" E, elev. 1827 m, mountain tundra, on *Ochrolechia frigida* (apothecia, thallus), 16.06.2015, L. A. Konoreva (LE 309229).

Note – New to South Siberia.

*DACTYLOSPORA PERTUSARIICOLA (Tuck.) Hafellner – Leprindinskoe Plateau, 56°39'27" N, 117°25'34" E, elev. 1698 m, stone rubble, on *Pertusaria aspergilla* (thallus), 14.08.2012, L. A. Konoreva (LE 309237); confluence of Syul'ban River and Zolotoi Creek, 56°50'12" N, 117°17'21" E, elev. 1655 m, subalpine *Pinus pumila* shrubs, on *P. aspergilla* (apothecial margins, thallus), 14.06.2015, S. V. Chesnokov (LE 309267a); headwaters of Olenii Rog Creek, 56°48'20" N,

117°25'17" E, elev. 2020 m, mountain tundra, on *P. aspergilla* (apothecial margins, thallus), 17.06.2015, S. V. Chesnokov (LE 309263a).

Notes – Apothecia up to 0.7 mm diam. Epiphytium medium brown above, pale olive gray below, hymenium hyaline, subhymenium pale olive gray brown, hypothecium and exciple medium to dark brown; olive gray tinge fading in K. Ascospores ellipsoid to oblong, ends usually rounded, medium brown when mature, (7.5–)8.8–11.8(–14.7) × (4.4–)5.0–6.0(–7.0) μm, l/b = (1.4–)1.6–2.2(–2.6) (n = 67), (0–)1(–3)-septate, usually constricted at the septa, smooth-walled, non-halonate.

*DIDYMOCYRTIS CONSIMILIS Vain. s. l. – Shan'go River, 56°57'30" N, 117°48'20" E, elev. 1720 m, subalpine *Larix gmelinii* thin forest, on *Athallia holocarpa* (apothecial discs), 9.06.2014, L. A. Konoreva (LE 309335).

Notes – Ascospores pale brown, narrowly obovoid, with larger upper cell, sometimes markedly so, (9.3–)10.4–13.4(–15.3) × (4.8–)5.2–6.2(–6.3) μm, l/b = (1.6–)1.8–2.4(–2.9) (n = 28), (0–)1(–2)-septate, darkened triangle at the point of contact of the septum and lateral wall sometimes distinct, but not protruding externally, somewhat constricted at the median septum, finely verruculose (× 1000, DIC), halo not seen, overlappingly uniseriate in the ascus.

So far *Didymocyrtis consimilis* was known with certainty only on *Caloplaca cerina* group, however, the examined material on *Athallia* also fits its modern description (Ertz et al., 2015). The species was formerly known in Russia (mostly under its synonym *Phoma caloplacae* D. Hawksw.) from Karelia Republic (Räsänen, 1939), Bashkortostan Republic (Urbanavichus & Urbanavichene, 2011), Krasnoyarsk Territory (Hawksworth, 1981) and Chukotka (Zhurbenko, 2009a). New to South Siberia.

*DIPLOLAEVIOPSIS RANULA Giralt & D. Hawksw. (asexual stage) – Anarga River, 56°55'19" N, 118°01'50" E, elev. 1071 m, mixed forest, on *Lecanora cf. symmicta* (apothecial discs), 9.07.2013, Yu. V. Gerasimova (LE 309250a).

Note – New to Russia and Asia.

*ENDOCOCCUS ALECTORIAE (D. Hawksw.) D. Hawksw. – Headwaters of Srednii Sakukan River, 56°57'59" N, 117°37'60" E, elev. 1925 m, mountain tundra, on *Bryoria nitidula* (thallus), 16.06.2014, L. A. Konoreva (LE 309353).

Notes – Ascomata 75–100 μm diam., semi-immersed. Asci 58–63 \times 10–14 μm . Ascospores shortly clavate/narrowly obovoid, occasionally ellipsoid, usually with rather acute upper and sometimes lower ends, finally medium brown, (8.3–)10.0–12.0(–14.0) \times (3.7–)4.0–4.6(–4.8) μm , 1/b = (1.8–)2.3–2.9(–3.4) (n = 60), (0–)1-septate, slightly constricted at the septum, distinctly granulate, usually with 1(–2) large guttules in each cell.

In the species protologue asci were reported as being mainly 50 \times 12 μm and ascospores as 10.5–15.5 \times 3.5–4.5 μm (Hawksworth, 1971). So far *Endococcus alectoriae* was known only from the type collection in the Austrian Alps growing on *Alectoria ochroleuca*. *Bryoria* is a new host genus. New to Russia and Asia.

**ENDOCOCCUS MACROSPORUS* (Arnold) Nyl. – Baltiskoe gorge, 56°54'20" N, 117°39'21" E, elev. 1903m, mountain tundra, on *Rhizocarpon geographicum* (thallus), 2.07.2013, M. P. Andreev (LE 309275); Surpriznoe Lake, 56°54'20.5"N, 117°38'20.3"E, elev. 2011 m, mountain tundra, on *R. geographicum* (thallus), 05.07.2013, L. A. Konoreva (LE 309265); confluence of Syul'ban River and Zolotoi Creek, 56°50'11.9" N, 117°17'21.1" E, elev. 1655 m, subalpine *Pinus pumila* shrubs, on *R. geographicum* (thallus), 14.06.2015, S. V. Chesnokov (LE 309267b); headwaters of Olenii Rog Creek, 56°48'19.6" N, 117°25'17.3" E, elev. 2020 m, mountain tundra, on *R. geographicum* (thallus), 17.06.2015, S. V. Chesnokov (LE 309263b).

Notes – Ascomata up to 200 μm diam., protruding in the upper part. Ascospores ellipsoid to obovoid (wider above), usually with more or less acute apices, long remaining pale to medium olive gray, finally medium brown, darker at the apices and around the septum, (0–)1-septate, occasionally constricted at the septum, (9.8–)15.3–18.9(–23.2) \times (5.8–)6.7–7.9(–9.5) μm , 1/b = (1.4–)2.1–2.7(–3.6) (n = 201).

The species concept accepted here follows Sérusiaux et al. (1999). New to Russia.

**ENDOCOCCUS PROPINQUUS* (Körb.) D. Hawksw. s. l. – Azarova glacier, 56°54'11" N, 117°35'01" E, elev. 2020 m, mountain tundra, on *Porpidia* cf. *flavicunda* (thallus), 1.07.2013, L. A. Konoreva (LE 309277); Surpriznoe Lake, 56°54'21" N, 117°38'20" E, elev. 2011 m, mountain tundra, on *P. flavicunda* (thallus), 5.07.2013, L. A. Ko-

noreva (LE 309271); Zolotoi Creek, 56°50'22" N, 117°19'44" E, elev. 1666 m, mountain tundra, on *Calvitimela talayana* (thallus), 12.06.2015, L. A. Konoreva (LE 309262); headwaters of Olenii Rog Creek, 56°48'20" N, 117°25'17" E, elev. 2020 m, mountain tundra, on *C. armeniaca* (thallus), 17.06.2015, S. V. Chesnokov (LE 309338b).

Notes – The species has been described from *Porpidia tuberculosa* and thereafter reported from various genera of saxicolous crustose lichens including *Calvitimela* (Triebel, 1989; Santesson et al., 2004). We have not observed distinct differences between the examined specimens on *Porpidia* and *Calvitimela* including their ascospore size [(8.7–)10.9–12.5(–15.8) \times (5.8–)6.4–7.6(–9.5) μm , 1/b = (1.3–)1.4–1.8(–2.4) (n = 112, on *Porpidia*) and (9.0–)9.9–12.3(–14.8) \times (5.5–)6.0–7.0(–7.5) μm , 1/b = (1.3–)1.5–1.9(–2.2) (n = 54, on *Calvitimela*)] and thus suggest they are conspecific. *Calvitimela talayana* is a new host species.

ENDOCOCCUS RUGULOSUS Nyl. s. l. – Azarova glacier, 56°54'11" N, 117°35'01" E, elev. 2016 m, mountain tundra, on *Rhizocarpon subgemmatum* (thallus), 13.06.2014, L. A. Konoreva (LE 309268); on *Aspicilia* sp. (thallus), 13.06.2014, S. V. Chesnokov (LE 309244).

Notes – The species was described from *Verrucaria macrostoma* and subsequently reported from various genera of saxicolous crustose lichens including *Aspicilia* and *Rhizocarpon* (Triebel, 1989; Hafellner, 1993; Hafellner & Türk, 1995). Examined material fits the broad species concept sensu Triebel (1989) including the ascospore sizes, which are (12–)13–16(–16.5) \times (5.5–)6–7.5(–8) μm according to Triebel (1989), (12.0–)12.9–15.7(–16.8) \times (5.8–)6.2–7.8(–8.4) μm , 1/b = (1.5–)1.8–2.4(–2.7) (n = 25) in the specimen on *Aspicilia* and (11.3–)12.8–15.8(–17.5) \times (5.1–)5.9–7.7(–8.4) μm , 1/b = (1.6–)1.7–2.5(–3.1) (n = 46) in the specimen on *Rhizocarpon*.

**ENDOCOCCUS VERRUCISPORUS* Alstrup – Azarova glacier, 56°54'11" N, 117°35'01" E, elev. 2020 m, mountain tundra, on *Ionaspis lacustris* (thallus), 13.06.2014, S. V. Chesnokov (LE 309347a).

Notes – Ascospores of the examined material are somewhat longer than given in the species protologue, viz. (9.1–)10.5–13.1(–14.4) \times (4.9–)5.8–6.8(–7.4) μm , 1/b = (1.3–)1.6–2.2(–2.4) (n = 27) vs. 10–12 \times 6.5–7.5 μm (Alstrup et al., 1994). The species was previously reported from

Europe and North America, always on *Ionaspis lacustris* (Sérusiaux et al., 1999; Orange, 2002; Santesson et al., 2004; Kocourková & van den Boom, 2005; Alstrup et al., 2009; Brackel, 2010). New to Russia and Asia.

*EPIBRYON CONDUCTRIX (Norman) Nik. Hoffm. & Hafellner – Confluence of Uglovoi Creek and Srednii Sakukan River, 56°56'33" N, 117°36'51" E, elev. 1670 m, mountain tundra, on squamules of a *Catapyrenium*-like lichen growing on soil, 15.06.2014, S. V. Chesnokov (LE 309218a).

Note – New to South Siberia.

EPICLADONIA SANDSTEDEI (Zopf) D. Hawksw. – Shan'go River, 56°56'22" N, 117°48'34" E, elev. 1710 m, mixed forest, on *Cladonia* cf. *pyxidata* (basal squamules), 10.06.2014, S. V. Chesnokov (LE 309324); Medvezhii Creek, 56°54'46" N, 117°37'05" E, elev. 1752 m, mountain tundra, on *C.* cf. *pyxidata* (basal squamules, podetia), 14.06.2014, S. V. Chesnokov (LE 309348).

*EPIGLOEA FILIFERA Döbbeler – Confluence of Syul'ban River and Zolotoi Creek, 56°50'12" N, 117°17'23" E, elev. 1627 m, subalpine *Pinus pumila* shrubs, over *Stereocaulon* sp. (cephalodia, phyllocladia) close to soil, 14.06.2015, S. V. Chesnokov (LE 309226).

Notes – The species is not truly lichenicolous, but is often listed along with lichenicolous fungi. So far it was reported only from Europe, viz. England, Netherlands, Germany, Austria, Belgium, France and Ukraine (Döbbeler, 1984; Berger et al., 1998; Boissiere & Montavont, 1998; van den Boom, 1998; Sérusiaux et al., 1999; Khodosovtsev, 2005; Brackel, 2009; Smith et al., 2009). New to Russia and Asia.

*EPIGLOEA SOLEIFORMIS Döbbeler – Azarova glacier, 56°53'58" N, 117°34'59" E, elev. 2053 m, moraine in alpine belt, over *Stereocaulon lambii* (base of stems), 13.06.2014, S. V. Chesnokov (LE 309356c); Srednii Sakukan River, 56°56'28" N, 117°36'55" E, elev. 1686 m, subalpine *Salix* shrubs, over *S. botryosum* (stems and phyllocladia near soil), 18.06.2014, S. V. Chesnokov (LE 309366).

Note – The species is not truly lichenicolous, but is often listed along with lichenicolous fungi.

*LASIOSPHAERIOPSIS STEREOCAULICOLA (Linds.) O.E. Erikss. & R. Sant. – Mramornoe gorge, Mramornyi settlement, 56°54'38" N, 117°42'29" E, elev. 1806 m, stone field, on *Stereocau-*

lon sp. (stems), 3.07.2013, L. A. Konoreva (LE 309358b); headwaters of Shan'go River, 56°58'39" N, 117°49'08" E, elev. 2063 m, boulder field, on *S. botryosum* (phyllocladia, stems), 8.06.2014, S. V. Chesnokov (LE 309355b); confluence of Uglovoi Creek and Srednii Sakukan River, 56°56'33" N, 117°36'51" E, elev. 1670 m, mountain tundra, on *Stereocaulon* sp. (stems, phyllocladia), 15.06.2014, S. V. Chesnokov (LE 309218c).

LICHENOCONIUM USNEAE (Anzi) D. Hawksw. – Syul'ban River, 56°48'51" N, 117°18'17" E, elev. 1341 m, *Chosenia arbutifolia* forest, on *Melanohalea septentrionalis* (apothecial discs), 8.06.2015, S. V. Chesnokov (LE 309350).

*LICHENODIPLIS LECANORAE (Vouaux) Dyko & D. Hawksw. – Syul'ban River, 56°38'02" N, 117°11'51" E, elev. 1020 m, *Larix gmelinii* forest, on *Evernia mesomorpha* (thallus), 23.06.2015, S. V. Chesnokov (LE 309259b).

*LICHENOSTIGMA ALPINUM (R. Sant., Alstrup & D. Hawksw.) Ertz & Diederich – Syul'ban River, 56°50'38" N, 117°18'05" E, elev. 1378 m, *Larix gmelinii* forest, on *Ochrolechia* sp. (thallus) growing on lignum, 13.06.2015, S. V. Chesnokov (LE 309349b).

LICHENOSTIGMA MAURERI Hafellner – Shan'go River, 56°56'20" N, 117°48'28" E, elev. 1661 m, *Larix gmelinii* forest, on *Bryoria simplicior* (thallus), 10.06.2014, L. A. Konoreva (LE 309314); Syul'ban River, 56°48'51" N, 117°18'17" E, elev. 1341 m, *Chosenia arbutifolia* forest, on *Evernia esorediosa* (thallus), 8.06.2015, S. V. Chesnokov (LE 309315b); same river, 56°49'28" N, 117°18'18" E, elev. 1342 m, mixed forest, on *E. esorediosa* (thallus), 15.06.2015, S. V. Chesnokov (LE 309252); 56°38'02" N, 117°11'51" E, elev. 1020 m, *Larix gmelinii* forest, on *E. mesomorpha* (thallus), 23.06.2015, S. V. Chesnokov (LE 309259d).

Notes – Ascospores (10.3–)11.4–13.6(–14.5) × (5.0–)6.0–7.6(–8.4) μm, l/b = (1.5–)1.6–2.0(–2.2) (n = 32).

Bryoria simplicior is a new host species.

*LICHENOSTIGMA RUPICOLAE Fern.-Brime & Nav.-Ros. – Headwaters of Olenii Rog Creek, 56°48'20" N, 117°25'17" E, elev. 2020 m, mountain tundra, on *Pertusaria lactea* (thallus), 17.06.2015, S. V. Chesnokov (LE 309263c).

Notes – The species was previously known only

from Spain (Etayo, 2010; Fernandez-Brime et al., 2010) and Russian Caucasus (Zhurbenko & Kobzeva, 2014). New to Siberia.

*LLIMONIELLA-LIKE DISCOMYCETE (Fig. 2) – Confluence of Sul’ban River and Zolotoi Creek, 56°50'13" N, 117°17'24" E, elev. 1604 m, sub-alpine *Pinus pumila* shrubs with stones, on *Protoblastenia terricola* (thallus), 14.06.2015, L. A. Konoreva (LE 309323).

Notes – *Apothecia* more or less roundish, up to 0.6 mm diam., sessile, slightly constricted at the base, shiny, disc plane, brownish black, margin slightly prominent, blackish, dispersed

to contiguous by a few. *Exciple* medium reddish brown/dark reddish orange, K+ brownish orange (red tinge disappears), laterally with darker radial stripes, formed of rarely branched, radiating hyphae with strongly elongate lumina, 40–100 µm thick, basally formed of thick-walled, ± isodiametric cells mainly 4–8 µm diam., 100–200 µm thick, prolonged into an indistinct ‘stipe’. *Epihymenium* pale to medium brownish orange, K–, pigmentation amorphous, up to 10 µm tall. *Hymenium* colourless, not inspersed, 50–80 µm tall, I–, K/I– except periascal gel (see below). *Subhymenium* pale to medium brownish

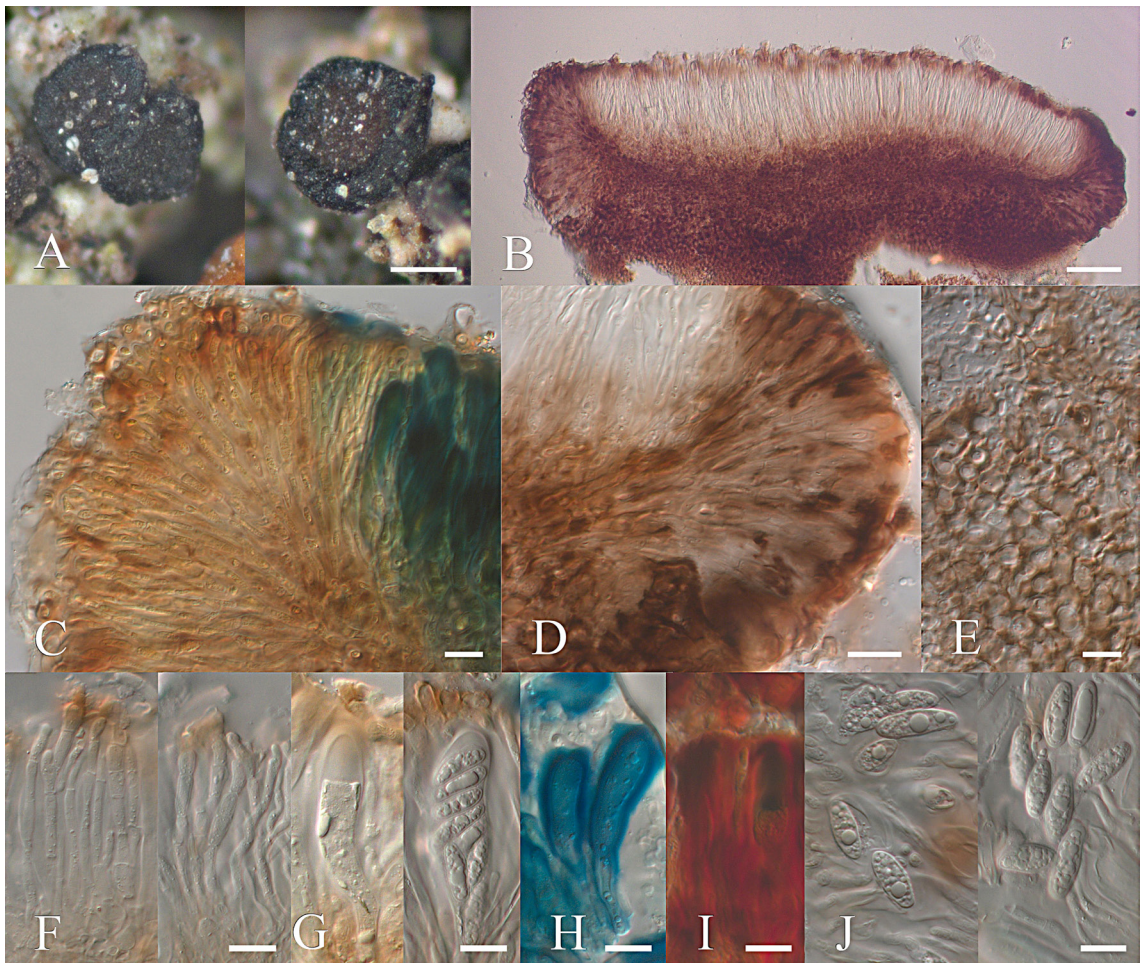


Fig. 2. *Llimoniella*-like discomycete on *Protoblastenia terricola* (LE 309323). A – habitus. B – ascoma in section (in water). C – lateral exciple in section (in K/I). D – lateral exciple in section (in K). E – basal exciple in section (in K). F – paraphyses (in K). G – immature (left) and mature (right) asci (in K). H – asci (in K/I). I – asci (in I). J – ascospores [in water (left) and K (right)]. Bars: A = 200 µm; B = 50 µm; C–J = 10 µm.

orange, rather indistinct. *Paraphyses* 2–3(–4) μm diam., septate, usually slightly constricted at the septa and slightly inflated between them, occasionally branched, apically often somewhat swollen, 3–4.5(–5) μm diam., easily separating in K under slight pressure. *Asci* unitunicate, non-fissitunicate, narrowly clavate, with rounded apex and long foot, wall apically thickened, up to 15 μm thick in immature asci, without ocular chamber, but occasionally with a thin short axial canal, ca. 50–65 \times 10–17 μm , 8-spored, wall/periascal gel I+ red (sometimes blue in the apical thickening), K/I+ blue (darker in the apical thickening). *Ascospores* colourless, narrowly ellipsoid or occasionally oblong, (12.5–)13.8–17.0(–21.0) \times (4.9–)5.1–6.3(–7.5) μm , 1/b = (2.0–)2.4–3.0(–3.6) (n = 66), aseptate, usually with one large and/or many small guttules, wall thin, smooth, without perispore, overlappingly biseriate or partly diagonally uniseriate in the ascus. *Conidiomata* not found. Pathogenicity not seen.

This possibly undescribed fungus is reminiscent of some species of *Llimoniella* s. l., which mainly differ in having asci I and K/I–, with only occasionally slightly thickened apical wall (Diederich & Etayo, 2000; Diederich et al., 2010).

**MERISMATIUM DECOLORANS* (Arnold) Triebel – Shan'go Lake, 56°58'45" N, 117°48'13" E, elev. 1944 m, mountain tundra, on *Peltigera leucophlebia* (old discoloured parts of thalli), 7.06.2014, S. V. Chesnokov (LE 309238).

**MUELLERELLA ERRATICA* (A. Massal.) Hafellner & V. John s. l. – Maloe Leprindo Lake, 56°38'12" N, 117°23'48" E, elev. 1232 m, rocks, on *Lecanora campestris* (apothecia, thallus), 17.08.2012, L. A. Konoreva [LE 309246b; ascospores (5.5–)6.2–7.8(–9.0) \times (3.5–)3.6–4.4(–5.1) μm , 1/b = (1.4–)1.5–1.9(–2.3) (n = 42)]; confluence of Medvezhii and Surpriznyi Creeks, 56°54'54" N, 117°37'41" E, elev. 1678 m, rocks, on *Pleopsideium chlorophanum* (thallus), 1.07.2013, M. P. Andreev (LE 309249); Shan'go River, 56°57'31" N, 117°48'05" E, elev. 1740 m, stone rubble, on *Rusavskia elegans* (apothecia, thallus), 9.06.2014, S. V. Chesnokov [LE 309240; ascospores (6.4–)7.0–9.0(–10.8) \times (2.8–)2.9–3.5(–3.7) μm , 1/b = (1.9–)2.1–2.9(–3.9) (n = 25)]; confluence of Uglovoi Creek and Srednii Sakukan River, 56°56'33" N, 117°36'51" E, elev. 1670 m, rocky outcrops, on *P. chlorophanum* (thallus), 15.06.2014, S. V. Chesnokov (LE 309255);

Zolotoi Creek, 56°50'22" N, 117°18'27" E, elev. 1407 m, limestones, on *Porpidia flavicunda* (thallus), 12.06.2015, L. A. Konoreva [LE 309266; ascospores (5.6–)6.4–7.6(–8.9) \times (3.9–)4.2–4.6(–4.9) μm , 1/b = (1.3–)1.4–1.8(–2.0) (n = 43)].

Notes – The examined specimens significantly vary in the ascospore size. The identification of specimens on *Pleopsideium* [ascospores (6.0–)6.7–8.0(–11.5) \times (3.6–)3.8–4.6(–5.0) μm , 1/b = (1.3–)1.6–2.2(–2.9) (n = 47)] is somewhat uncertain due to unusual host genus.

**MUELLERELLA LICHENICOLA* (Sommerf.) D. Hawksw. – Confluence of Syul'ban and Pravyi Syul'ban Rivers, 56°51'37" N, 117°17'22" E, elev. 1420 m, scree, on *Lecanora* cf. *intricata* (apothecia, thallus), 11.06.2015, L. A. Konoreva (LE 309278).

Note – New to South Siberia.

MUELLERELLA VENTOSICOLA (Mudd) D. Hawksw. – Leprindinskoe Plateau, 56°39'27" N, 117°25'52" E, elev. 1738 m, mountain tundra, on *Immersaria athrocarpa* (apothecia, thallus), 16.08.2012, M. P. Andreev (LE 309264; identification uncertain due to unusual host); Medvezhii Creek, 56°54'40" N, 117°37'04" E, elev. 1764 m, mountain tundra, on *Rhizocarpon geographicum* (thallus), 1.07.2013, L. A. Konoreva (LE 309270); headwaters of Shan'go River, 56°58'36" N, 117°48'24" E, elev. 1874 m, boulders, on *Ophioparma ventosa* (thallus), 7.06.2014, L. A. Konoreva (LE 309326); Shan'go Lake, 56°58'41" N, 117°47'50" E, elev. 1908 m, mountain tundra, on *O. ventosa* (thallus), 7.06.2014, S. V. Chesnokov (LE 309320).

**NEOLAMYA PELTIGERAE* (Mont.) Theiss. & Syd. – Olenii Rog Creek, 56°48'14" N, 117°24'16" E, elev. 1860 m, limestones, on *Peltigera lepidophora* (thallus), 16.06.2015, S. V. Chesnokov (LE 309352).

**NESOLECHIA FUSCA* (Triebel & Rambold) Pérez-Ortega – Shan'go Lake, 56°58'45" N, 117°48'13" E, elev. 1944 m, mountain tundra, on *Xanthoparmelia stenophylla* (thallus), 7.06.2014, L. A. Konoreva (LE 309254a).

NESOLECHIA OXYSPORA (Tul.) A. Massal. – Anarga River, 56°55'11" N, 118°01'45" E, elev. 941 m, mixed forest, on *Parmelia sulcata* (thallus), 9.07.2013, L. A. Konoreva (LE 309221); Syul'ban River, 56°50'41" N, 117°17'57" E, elev. 1381 m, *Chosenia arbutifolia* forest, on *P. sulcata* (thal-

lus), 13.06.2015, S. V. Chesnokov (LE 309322b); 56°49'28" N, 117°18'18" E, elev. 1342 m, mixed forest, on *P. sulcata* (thallus), 15.06.2015, S. V. Chesnokov (LE 309253).

*OPEGRAPHA GEOGRAPHICOLA (Arnold) Hafellner – Headwaters of Olenii Rog Creek, 56°48'31" N, 117°24'53" E, elev. 1971 m, mountain tundra, on *Rhizocarpon* sp. (thallus), 16.06.2015, L. A. Konoreva (LE 309269).

Notes – Formerly known in Russia only from Chukotka (Zhurbenko, 2009b). New to Siberia.

PHACOPSIS CEPHALODIODES (Nyl.) Triebel & Rambold – Shan'go River, 56°56'22" N, 117°48'34" E, elev. 1710 m, mixed forest, on *Hypogymnia bitteri* (thallus), 10.06.2014, L. A. Konoreva (LE 309330); Syul'ban River, 56°49'28" N, 117°18'18" E, elev. 1342 m, mixed forest, on *H. bitteri* (thallus), 15.06.2015, S. V. Chesnokov (LE 309251, LE 309257a).

*PHAEOSPORA CF. RIMOSICOLA (Mudd) Hepp – Headwaters of Olenii Rog Creek, 56°48'20" N, 117°25'17" E, elev. 2020 m, mountain tundra, on *Rhizocarpon umbilicatum* (thallus), 17.06.2015, S. V. Chesnokov (LE 309248).

Notes – Ascospores black, globose, 100–200 µm diam., with rough surface, slightly protruding to sessile; wall reddish brown, K–, externally with dark protrusions, in surface view of texture angularis. Hymenial gel I+ red, K/I+ blue. Distinct interascal filaments not observed. Periphyses 1.5–2(–3) µm diam., septate, occasionally branched, not capitate. Asci clavate or sometimes obclavate, ca. 60–70 × 13–25 µm,

wall apically thickened up to 4 µm, distinct ocular chamber not observed, 8-spored, I–, K/I–. Ascospores initially hyaline, later pale orange-brown, broadly to narrowly ellipsoid, narrowly obovoid, occasionally fusiform or narrowly oblong (Fig. 3), (11.2–)14.9–18.5(–20.9) × (5.5–)6.4–8.2(–8.9) µm, 1/b = (1.3–)2.0–2.6(–3.3) (n = 106), (0–)3-septate, sometimes slightly or strongly constricted at the septa, wall 0.5–1.3 µm thick, smooth, usually with large guttule in each cell when young, sometimes with halo up to 2.5 µm thick (in water and particularly in K), irregularly 2–3-seriate in the ascus. Pathogenicity not observed.

Sérusiaux et al. (1999) compared two species of *Phaeospora* known from species of *Rhizocarpon*, viz. *P. parasitica* (Lönnr.) Arnold, characterized by ascospores 150–225 µm diam. and ascospores 18–23 × 8–11.5 µm, and *P. rimosicola*, characterized by ascospores 60–125 µm diam. and ascospores 16–19 × 5–7 µm. According to these characteristics the examined material does not match any of these species, though is closer to *Phaeospora rimosicola*. However, according to Hawksworth (1985) ascospores of *Phaeospora rimosicola* type are 18–19 × 6.5–7 µm, which better fits the examined specimen. The species was previously known in Asia from Turkey (Halici & Aksoy, 2009) and Chukotka Autonomous Area of Russia (Karatygin et al., 1999). New to South Siberia.

*PLECTOCARPON MELANOHALEAE Christnach, Ertz & Diederich (Fig. 4) – Anarga River, 56°55'19" N, 118°01'50" E, elev. 1071 m, mixed forest, on



Fig. 3. Ascospores of *Phaeospora* cf. *rimosicola* at different stages of maturation (in water, except for the extreme right in the bottom row observed in K/I; LE 309248). Bar = 10 µm.

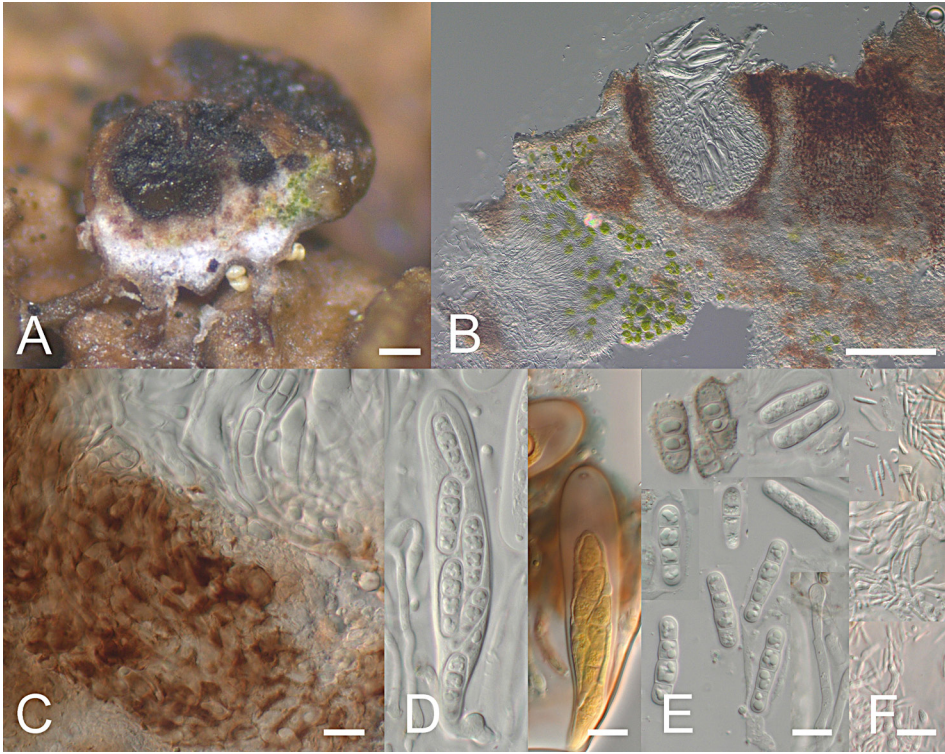


Fig. 4. *Plectocarpon melanothaleae* (LE 309351c). A – sectioned gall with ascomata. B – ascoma (middle) and conidioma (left) in section (in water). C – stromatic tissue around fertile locule (in water). D – asci [in K (left) and K/I (right)]. E – ascospores (in K). F – conidiogenous cells and conidia (in K). Bars: A, B = 100 μm ; C–F = 10 μm .

Melanothalea olivacea (thallus), 9.07.2013, Yu. V. Gerasimova (LE 309351c).

Notes – *Locules* subspherical, up to 200 μm diam., surrounded by medium to dark reddish brown, K+ gray olive, patchy pigmented stromatic ‘wall’; immersed in lichenized subglobose, constricted below gall 0.7 mm diam. developed on the host thallus. *Hymenium* hyaline, I and K/I+ blue, then quickly red. *Paraphyses* frequently septate, richly branched, 2–3.5 μm diam., sometimes with enlarged end cells. *Asci* elongate clavate, 65–100 \times 14–15 μm , 8-spored, I and K/I– except for occasionally observed K/I+ blue apical ring. *Ascospores* hyaline, initially with hyaline, smooth perispore, which occasionally becomes brown and granulate at maturity, oblong or slightly tapering below, ends often blunt, (15.5–)17.6–22.0(–24.4) \times (4.3–)4.7–6.3(–7.5) μm , l/b = (2.7–)3.0–4.2(–5.7) (n = 34, in water, K or K/I), (1–)3-septate, usually slightly constricted at the septa. *Conidiomata* immersed in stroma

between the locules. *Conidia* hyaline, narrowly fusiform, aseptate, ca. 6–7.5 \times 1 μm .

The studied fungus differs from typical *Plectocarpon* species, as well as from the species protologue, (Ertz et al., 2005) in looking like aggregated perithecioid ascomata immersed in a bullate gall on the host thallus, instead of multilocular stromatic ascomata. However, it is mentioned in the protologue that the sterile stromatic tissue is poorly developed around fertile locules. The examined material may also represent young ascomata. Another discrepancy with the *Plectocarpon* concept adopted by Ertz et al. (2005) is a K/I+ red vs. K/I+ blue hymenial gel. Furthermore, in the species protologue conspicuous galls and brown granulate perispore are not mentioned, the paraphyses are described as apically not distinctly enlarged, 1.5–2.5 μm diam., and the asci shorter, 48–70 μm long. So far the species was known only from

Tierra del Fuego in Chile growing on the thallus of *Melanohalea ushuaiensis* (Ertz et al., 2005; Etayo & Sancho, 2008). New for the northern hemisphere. *Melanohalea olivacea* is a new host species.

*PRONECTRIA ROBERGEI (Mont. & Desm.) Lowen – Confluence of Syul'ban River and Zolotoi Creek, 56°50'13" N, 117°17'24" E, elev. 1604 m, subalpine *Pinus pumila* shrubs, on *Peltigera collina* (thallus), 14.06.2015, L. A. Konoreva (LE 309241; anamorph).

*PYRENIDIUM ACTINELLUM Nyl. – Headwaters of Shan'go River, 56°58'37" N, 117°49'13" E, elev. 2037 m, mountain tundra, on *Baeomyces placophyllus* (thallus), 8.06.2014, L. A. Konoreva (LE 309367); Uglovoe Lake, 56°56'41" N, 117°35'12" E, elev. 1918 m, mountain tundra, on *Solorina crocea* (moribund thallus), 17.06.2014, S. V. Chesnokov (LE 309321a).

RAESAENENIA HUUSKONENII (Räsänen) D. Hawksw., Boluda & H. Lindgr. – Syul'ban River, 56°38'02" N, 117°11'51" E, elev. 1020 m, *Larix gmelinii* forest, on *Bryoria* sp. (thallus), 23.06.2015, S. V. Chesnokov (LE 309258).

*ROSELLINIELLA STEREOCAULORUM Zhurb., Kukwa & Oset – Sul'ban River, 56°49'27" N, 117°18'12" E, elev. 1338 m, *Chosenia arbutifolia* forest, on *Stereocaulon rivulorum* (phyllocladia), 10.06.2015, L. A. Konoreva (LE 309359).

Note – The species was previously known in Russia from Baikal Siberia and Yakutiya (Zhurbenko et al., 2009).

ROSELLINULA HAPLOSPORA (Th. Fr. & Almq.) R. Sant. – Olenii Rog Creek, 56°47'57" N, 117°21'59" E, elev. 1674 m, subalpine *Pinus pumila* shrubs, on gray saxicolous lichen (apothecia, thallus), 18.06.2015, S. V. Chesnokov (LE 309274); on *Aspicilia* sp. (thallus), 18.06.2015, L. A. Konoreva (LE 309313).

Notes – Ascospores ellipsoid or broadly ellipsoid, mainly with more or less acute apices, occasionally orbicular, medium brown when mature, aseptate, smooth-walled, non-halonate, somewhat smaller than reported by Hafellner (1985), viz. (5.3–)6.3–8.5(–10.4) × (3.9–)4.2–5.2(–6.3) μm, l/b = (1.0–)1.3–1.9(–2.3) (n = 79) vs. 7–11 × 4.5–6.5 μm, but of the same size as in LE 261058 specimen, which was also reported from Trans-Baikal Territory (Zhurbenko & Yakovchenko, 2014).

*SAGEDIOPSIS ASPICILIAE (Vain.) Nik. Hoffm. & Hafellner – Confluence of Medvezhii and Surpriznyi Creeks, 56°54'54" N, 117°37'41" E, elev. 1678 m, rocks, on *Aspilidea myrinii* (thallus, occasionally apothecia), 1.07.2013, M. P. Andreev (LE 309247); headwaters of Olenii Rog Creek, 56°48'31" N, 117°24'53" E, elev. 1971 m, mountain tundra, on *Aspicilia* sp. (thallus, occasionally apothecia), 16.06.2015, S. V. Chesnokov (LE 309245); same creek, 56°48'20" N, 117°25'17" E, elev. 2020 m, mountain tundra, on *A. myrinii* (thallus), 17.06.2015, S. V. Chesnokov (LE 309338a).

Notes – Ascospores (8.5–)9.7–13.7(–17.2) × (4.8–)5.4–7.0(–8.4) μm, l/b = (1.1–)1.4–2.4(–3.2) (n = 34). New to South Siberia.

*SAGEDIOPSIS FISSURISEDENS Hafellner – Zolotoi Creek, 56°55'57" N, 117°36'51" E, elev. 1857 m, mountain tundra, on *Aspicilia* sp. (thallus), 6.07.2013, L. A. Konoreva (LE 309273).

Notes – Hymenial gel I–, K/I+ blue. Ascospores hyaline, ellipsoid, narrowly ellipsoid, occasionally oblong or slightly obovate, (8.2–)11.2–14.4(–15.5) × (4.1–)4.3–5.5(–6.5) μm, l/b = (1.8–)2.1–3.1(–3.6) (n = 32), 1–3-septate, only exceptionally slightly constricted at the septa, usually with a large guttule in each cell, smooth-walled, halo not observed.

In the species protologue the ascospores were reported as ellipsoid, 12–14.5–17 × 5–8 μm (Hafellner, 1993). New to Russia and Asia.

*SAGEDIOPSIS PERTUSARIICOLA Zhurb. – Azarova glacier, 56°53'58" N, 117°34'59" E, elev. 2053 m, mountain tundra, on *Pertusaria*-like sterile lichen growing over moribund mosses, 13.06.2014, L. A. Konoreva (LE 309337).

Notes – Formerly known only from the Arctic (Zhurbenko, 2009c). New to South Siberia.

*SPHAERELLOTHECIUM CONTEXTUM Triebel – Confluence of Medvezhii and Surpriznyi Creeks, 56°54'54" N, 117°37'41" E, elev. 1678 m, rocks, on *Calvitimela armeniaca* (thallus), 1.07.2013, M. P. Andreev (LE 309279).

Note – New to South Siberia.

*SPHAERELLOTHECIUM CF. PARMELIAE Diederich & Etayo – Headwaters of Shan'go River, 56°58'36" N, 117°49'12" E, elev. 1994 m, mountain tundra, on *Parmelia omphalodes* (thallus), 8.06.2014, S. V. Chesnokov (LE 309225).

Notes – The examined specimen is conspecific with those published under the same name (also with 'cf.') in Zhurbenko & Zheludeva (2015). This material differs from the species protologue (Etayo & Diederich, 1998) in that it is not associated with black necrotic areas of the host lobes as well as in several other features, which were noted in the above-mentioned publication.

*STIGMIDIUM CONSPURCANS (Th. Fr.) Triebel & R. Sant. – Shan'go Lake, 56°58'45" N, 117°48'13" E, elev. 1944 m, rocks, on *Psora rubiformis* (squamules), 7.06.2014, L. A. Konoreva (LE 309224); Olenii Rog Creek, 56°48'22" N, 117°23'26" E, elev. 1874 m, rocks, on *P. rubiformis* (squamules), 19.06.2015, S. V. Chesnokov (LE 309223).

Notes – Ascospores mostly hyaline and smooth, occasionally pale brown and verruculose when overmature, (11.1–)12.7–15.1(–17.1) × (4.7–)5.0–6.2(–6.9) μm, 1/b = (1.8–)2.1–2.9(–3.5) (n = 31, in water or BCr), BCr–. New to South Siberia.

*STIGMIDIUM MITCHELLII Cl. Roux & Bricaud – Azarova glacier, 56°53'58" N, 117°34'59" E, elev. 2053 m, mountain tundra, on *Protopannaria pezizoides* (mostly blackened moribund apothecia, occasionally thallus), 13.06.2014, S. V. Chesnokov (LE 309317).

Note – New to South Siberia.

STIGMIDIUM PSEUDOPELTIDEAE Cl. Roux & Triebel – Shan'go River, 56°56'22" N, 117°48'43" E, elev. 1841 m, subalpine *Betula* thin forest, on *Peltigera venosa* (thallus), 10.06.2014, L. A. Konoreva (LE 309341b).

*STIGMIDIUM PUMILUM (Lettau) Matzer & Hafellner – Shan'go River, 56°57'31" N, 117°48'05" E, elev. 1740 m, stone field, on *Physcia caesia* (thallus), 9.06.2014, L. A. Konoreva (LE 309333); headwaters of Olenii Rog Creek, 56°48'31" N, 117°24'53" E, elev. 1971 m, mountain tundra, on *P. phaea* (thallus), 16.06.2015, L. A. Konoreva (LE 309261); 56°47'57" N, 117°21'59" E, elev. 1674 m, subalpine *Pinus pumila* shrubs, on *P. caesia* (thallus), 18.06.2015, L. A. Konoreva (LE 309327);

*STIGMIDIUM SOLORINARIUM (Vain.) D. Hawksw. – Olenii Rog Creek, 56°48'13" N, 117°24'16" E, elev. 1827 m, mountain tundra, on *Solorina bispora* (thallus), 16.06.2015, L. A. Konoreva (LE 309260).

Note – New to South Siberia.

*TAENIOLELLA BESCHIANA Diederich – Olenii Rog Creek, 56°47'57" N, 117°21'59" E, elev. 1674 m, subalpine *Pinus pumila* shrubs, on *Cladonia* sp. (basal squamules, podetia), 18.06.2015, L. A. Konoreva (LE 309332c).

*TALPAPELLIS PELTIGERAE Alstrup & M.S. Cole var. PELTIGERAE – Shan'go River, 56°56'22" N, 117°48'43" E, elev. 1841 m, subalpine *Betula* thin forest, on *Peltigera venosa* (thallus), 10.06.2014, L. A. Konoreva (LE 309341a).

Notes – The species was recently revised by Heuchert et al. (2014). It is new to South Siberia, and var. *peltigerae* is new to Russia and Asia.

*TETRAMELAS PHAEOPHYSCIAE A. Nordin & Tibell – Zolotoi Creek, 56°55'57" N, 117°36'51" E, elev. 1857 m, mountain tundra, on *Phaeophyscia sciastra* (thallus), 6.07.2013, L. A. Konoreva (LE 309239).

Note – According to Nordin & Tibell (2005) this is an obligately lichenicolous endoparasitic lichen, however, it is often listed together with lichenicolous fungi.

*UNGUICULARIOPSIS LETTAUI (Grumann) Coppins – Syul'ban River, 56°38'02" N, 117°11'51" E, elev. 1020 m, *Larix gmelinii* forest, on *Everina mesomorpha* (thallus), 23.06.2015, S. V. Chesnokov (LE 309259a).

Note – Formerly known in Russia only from the Caucasus (Zhurbenko & Otte, 2012), new to Siberia.

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