The lichen genus *Usnea* Dill. ex Adans. in the Sakha Republic (Yakutia)

Ludmila V. Gagarina^{1*}, Lena N. Poryadina², Sergey V. Chesnokov¹
& Liudmila A. Konoreva^{1,3}

Ludmila V. Gagarina ^{1*}
e-mail: gagarinalv@binran.ru
Lena N. Poryadina ²
e-mail: poryadina-lena@rambler.ru
Sergey V. Chesnokov¹
e-mail: lukinbrat@mail.ru
Liudmila A. Konoreva^{1,3}
e-mail: ajdarzapov@yandex.ru

¹ Komarov Botanical Institute RAS, St. Petersburg, Russia

² Institute for Biological Problems of Cryolithozone SB RAS, Yakutsk, Russia

³ The Polar-Alpine Botanical Garden and Institute, Kola Science Centre RAS, Apatity, Russia

* corresponding author

ABSTRACT

The occurrence of lichens belonging to the genus *Usnea* was studied in Yakutia. Eight species have been revealed: *U. barbata* (L.) F.H. Wigg., *U. cavernosa* Tuck., *U. dasypoga* (Ach.) Nyl., *U. glabrescens* (Nyl. ex Vain.) Vain., *U. hirta* (L.) W.H. Wigg., *U. lapponica* Vain., *U. longissima* Ach. and *U. subfloridana* Stirt. Distribution maps, an identification key and notes with diagnostic features and distribution data for each species are provided.

Key words: lichens, *Usnea*, identification key, Yakutia

РЕЗЮМЕ

Гагарина Л.В., Порядина Л.Н., Чесноков С.В., Конорева Л.А. Род *Usnea* Dill. ex Adans. в республике Саха (Якутия). Изучены лишайники из рода *Usnea* в Якутии. Выявлено восемь видов: *U. barbata* (L.) F.H. Wigg., *U. cavernosa* Tuck., *U. dasypoga* (Ach.) Nyl., *U. glabrescens* (Nyl. ex Vain.) Vain., *U. hirta* (L.) W.H. Wigg., *U. lapponica* Vain., *U. longissima* Ach., и *U. subfloridana* Stirt. Приведены карты распространения видов. Составлен ключ для определения видов и даны краткие видовые особенности.

Ключевые слова: лишайники, *Usnea*, ключ для определения видов, Якутия

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Lichenological investigations have been carried out in the Sakha Republic (Yakutia) for more than 100 years. At present, 813 species are known (Andreev 2004, Poryadina 2005, Zhurbenko et al. 2005, Søchting & Figueras 2007, Vershinina et al. 2012, 2015, Zhurbenko & Vershinina 2014, Ahti et al. 2015, Chesnokov et al. 2015, 2016, Konoreva et al. 2016). Further studies, however, are revealing additional species for Yakutia as well as new localities, indicating knowledge is far from complete.

The genus *Usnea* (Parmeliaceae, Ascomycota) consists of more than 300 widely distributed species. 40 species are known from Russia. The genus *Usnea* includes fruticose lichens with a central axis consisting of a cartilaginous strand of longitudinal hyphae. Thallus attached by a holdfast. Branches cylindrical, fusiform, tapering or irregular, with or without papillae, fibrils, soralia, and pseudocyphellae. Cortex composed of radially or irregularly oriented hyphae. Medulla lax, dense or compact, sometimes pink-pigmented. Ascomata zeorine apothecia, rare in most species. Photobiont trebouxoid. Cortex contains usnic acid. Medulla contains diverse secondary metabolites (Halonen et al. 1998, Articus 2004, Randle et al. 2009, Clerc 2011).

MATERIAL AND METHODS

Lichens in the herbarium of the Institute for Biological Problems of Cryolithozone of the Siberian Branch of

RAS were revised in 2016. Materials collected by S.V. Chesnokov and L.A. Konoreva from expeditions in Aldan and Neryungri Regions were also studied. Lichen identification was carried out by L.V. Gagarina. M.P. Zhurbenko identified lichenicolous fungi growing on *Usnea* thalli.

Morphology and anatomy were studied using a light microscope and a dissecting microscope. HPTLC was performed according to standard procedures (Culbertson & Ammann 1979, Kranner et al. 2002), using solvent system A and B.

Samples from these expeditions were deposited in the herbaria of the Komarov Botanical Institute (LE) and the Institute for Biological Problems of Cryolithozone Siberian Branch of RAS (SASY).

RESULTS

In total, 8 species belonging to the genus *Usnea* are here accepted as occurring in Yakutia: *U. barbata* (L.) F.H. Wigg., *U. cavernosa* Tuck., *U. dasypoga* (Ach.) Nyl., *U. glabrescens* (Nyl. ex Vain.) Vain., *U. hirta* (L.) W.H. Wigg., *U. lapponica* Vain., *U. longissima* Ach. and *U. subfloridana* Stirt. According to the literature, an additional species, *U. articulata* (L.) Hoffm., was reported from Central Yakutsk floristic region. However, *U. articulata* is not accepted here in the list of species, because all specimens were previously misidentified (Poryadina 2005, Vershinina et al. 2012, 2015). The distributional

ranges of *U. hirta* and *U. longissima* have decreased in Yakutia. At the same time, *U. cavernosa*, *U. glabrescens* and *U. subfloridana* have expanded in range in this region.

Distribution maps, an identification key and notes with principal diagnostic features and distribution data for each species are provided.

Key to *Usnea* in the Sakha Republic (Yakutia)

1. Main branches decorticate, the majority of branches distinct, with numerous perpendicular fibrils; thallus very long, up to several meters *U. longissima*
1. Main branches persistently corticate, branches usually divided and always persistently corticated; thallus shorter (never longer than 60 cm) 2
2. Thallus pendent 3
2. Thallus shrubby to subpendent 7
3. Older parts forming sausage-like segments [*U. articulata*]
3. Older parts not forming sausage-like segments 4
4. Papillae, isidia and soralia absent 5
4. Papillae, isidia and soralia present 6
5. Branches conspicuously foveolate and ridged; fibrils absent to scarce *U. cavernosa*
5. Branches slightly or distinctly foveolate and ridged; fibrils scarce to numerous *U. barbata*
6. Thallus not divided into regular segments by annual cracks; soralia often bearing isidia *U. dasypoga*
6. Thallus divided into irregular segments by annular cracks; isidia few or absent *U. barbata*
7. With papillae 8
7. Without papillae; isidia numerous *U. hirta*
8. Soralia bearing isidia *U. subfloridana*
8. Soralia not bearing isidia 9
9. Thallus mainly anisotomic-dichotomous; soralia expanded and irregular or bracelet-like *U. lapponica*
9. Thallus mainly isotomic-dichotomous; soralia punctiform *U. glabrescens*

Species characteristics and specimens examined

Usnea barbata (L.) F.H. Wigg.

The species is very polymorphic. Characterised by having a pendent thallus, divided into irregular segments by annular cracks. Branches uneven in thickness. Base blackened, fibrils few to numerous, isidia few or absent. The main diagnostic features are its thin cortex, the strongly irregular branches and inflated segments.

Two chemotypes have been recorded: (1) medulla with salazinic acid, cortex with usnic acid; (2) medulla with salazinic, barbatic/diffractaic acid, cortex with usnic acid.

The species occurs in Lensk Region according to herbarium collections and own materials, and is also reported from Olekminsk Region (Vershina et al. 2015) (Fig. 1A).

Specimens examined: LENSK REGION, 17 km E from village Vitim, wood sorrel spruce forest, branches of *Picea* sp., 05.07.1989, leg. Isaev A.P. (SASY, Us 8); bor-

der with Irkutsk Region, right bank of the river Vitim (59°27'12"N, 112°55'58"E), 4 km downstream from the river Talaya (59°08'18"N, 112°40'52"E), mixed forest, on the branches of *Picea* sp., 12.06.2004, leg. Poryadina L. N. (SASY, Us 27).

Usnea cavernosa Tuck.

The species is characterised by having a pendulous thallus, with parallel branches. Branches foveolate and ridged. Base pale, fibrils absent to scarce, papillae absent, soralia and isidia absent. The main diagnostic feature is the foveolate and ridged branches.

One chemotype has been recorded: medulla with salazinic acid, cortex with usnic acid.

The species is widespread in Yakutia (Fig. 1B).

Specimens examined: ALDAN REGION, right bank of the river Aldan (58°49'52"N, 127°42'45"E), spruce-larch forest, on the branches of *Picea* sp., 21.07.2015, leg. Poryadina L.N. (SASY, Us 87); left bank of the river Aldan, firth of the river Unil'ya, 78 km upper village Ugino (58°45'36"N, 128°02'24"E), spruce-pine forest, 24.06.1980, leg. Zaharova V.I. (SASY, Us 74); rock on the left bank of the river Aldan, near firth of the river Timpton (58°44'11"N, 127°10'31"E), 15.07.2015, leg. Konoreva L.A. (LE); near village Zarechnyi (58°46'34.4"N, 126°25'45.3"E), fir forest, *Picea* sp., 12.07.2015, leg. Poryadina L.N. (SASY, Us 85). ZHIGANSK REGION, right bank of the river Lena, water gap of the river Uchuge (left influx of the river Nimingde) (67°14'18.8"N, 124°16'1.7"E), pyroloideae fir forest with wild rose, 20.07.1958, leg. Dobretsova L.A. (SASY). KOBYAISK REGION, near river Undyulyung, near orifice river Byrand'ya (66°13'49"N, 126°58'36"E), fir forest, on the branches and bark of *Picea* sp., 12.07.1990, leg. Fes'ko N.N. (SASY, Us 61); left bank of the river Lyunkyubei (64°9'37"N, 126°58'59"E), fir forest, on the branches of *Picea* sp., 08.07.2002, leg. Poryadina L.N. (SASY, Us 58); firth of the river Sagandzhi (65°27'9"N, 126°58'41"E), spruce-larch forest, on the branches of *Picea* sp., 25.05.1985, leg. Volotovskii K.A. (SASY, Us 12); SW branches of the Verchoyansk Range, valley of the river Yus-Yuryah (64°52'9"N, 126°40'36"E), *Picea* sp., 17.06.1953, leg. Gryaznuhin A.N. (SASY, Us 91). LENSK REGION, right bank of the river Peledui, near island Noochoko-aryyta, 5 km below village In'yaly (59°30'35"N, 111°17'35"E), spruce-larch forest, on the branches of *Larix* sp., 18.08.1953, leg. Kuvaev V.B. (SASY, Us 93); island in firth of river Nyuya (60°32'35"N, 116°18'38"E), old *Picea* sp., leg. Shcheludyakova V.A. (SASY, Us 94); left bank of the river Lena, Talakanskoe oil and gas field, the top of the hill (59°30'15.1"N, 110°38'58.4"E), spruce-larch forest, on the branches of *Larix* sp., leg. Poryadina L.N. (SASY, Us 13); border with Irkutsk Region, right bank of the river Vitim, 4 km downstream from the river Talaya (59°08'18"N, 112°40'52"E), mixed forest, deadwood, on the branches of *Picea* sp., 12.06.2004, leg. Poryadina L.N. (SASY, Us 26, Us 57, Us 62). NERYUNGRI REGION, 100 m to W from highway A-360, between rivers Manahta-1 and Manahta-2 (56°20'15.4"N, 124°45'51.7"E), bald mountain with *Pinus pumila* and *Duschekia* sp., on the branches of *Picea* sp., alt. 877 m, leg. Konoreva L.A., Chesnokov S.V. (LE).

Figure 1 Distribution of *Usnea* spp. (dots) in Sakha-Yakutia (outlined with solid gray line): A – *U. barbata* (L.) F.H. Wigg., B – *U. cavernosa* Tuck., C – *U. dasypoga* (Ach.) Nyl., D – *U. glabrescens* (Nyl. ex Vain.) Vain., E – *U. birta* (L.) W.H. Wigg., F – *U. lapponica* Vain., G – *U. longissima* Ach., H – *U. subfloridana* Stirt. See text for details.

OLENEK REGION, left bank of the river Tyung (below orifice Sr. Salakuta) (66°35'3"N, 115°50'28"E), spruce-larch forest, 17.07.1957, leg. Dobretsova L.A. (SASY, Us 92). OLEKMINSK REGION, right bank of the river Biryuk (60°22'12"N, 119°29'25"E), fir forest, on the branches of *Picea* sp., 16.07.2008, leg. Poryadina L.N. (SASY, Us 60).

Usnea dasypoga (Ach.) Nyl.

The species is very polymorphic. Thallus pendulous, base blackened, fibrils and isidia conspicuous and numerous, papillae sparse to abundant, soralia punctiform, often bearing isidia. The main diagnostic features are its pendulous thallus, slightly or distinctly inflated segments.

A single chemotype has been recorded: medulla with salazinic acid; cortex with usnic acid.

The species occurs in Lensk Region according to herbarium and own materials and has also been reported from Olekminsk Region (Vershina et al. 2015) (Fig. 1C).

Specimens examined: LENSK REGION, 17 km E from village Vitim (59°27'12"N, 112°55'58"E), wood sorrel spruce forest, branches of *Picea* sp., 05.07.1989, leg. Zaharova V.I. (SASY, Us 7); right bank of the river Lena, near village Krestovaya (59°46'5"N, 113°18'1"E), *Pinus pumila*-larch forest with cowberry, branches of *Picea* sp., 30.06.1989, leg. Isaev A.P. (SASY, Us 5).

Usnea glabrescens (Nyl. ex Vain.) Vain.

Thallus shrubby or subpendent, base blackened, fibrils present, soralia distinctly rounded, isidia absent. The main diagnostic features are its isotomic-dichotomous branches

and distinctly rounded punctiform soralia.

Four chemotypes have been recorded: (1) medulla with salazinic and diffractaic acids, cortex with usnic acid; (2) medulla with psoromic acid, cortex with usnic acid; (3) medulla with thamnolic acid, cortex with usnic acid; (4) medulla without lichen substances, cortex with usnic acid.

The species occurs in Aldan, Kobyaisk, Lensk regions according to herbarium collections and own materials and also in Olekminsk Region (Vershina et al. 2015) (Fig. 1D).

Specimens examined: ALDAN REGION, left bank of the river Aldan, orifice of the river Unil'ya, 78 km upper village Ugino (58°45'36"N, 128°2'24"E), spruce-pine forest, 24.06.1980, leg. Zaharova V.I. (SASY, Us 74); stream Bezmyannyi (58°44'40"N, 126°21'48"E), alt. 491 m, forest with spruce, birch, larch, deadwood, 11.07.2015, leg. Konoreva L.A. (LE); near town Aldan, bank of the river Bol'shoi Kuranah (58°38'33.6"N, 125°28'05.9"E), dark-coniferous forest and forest of small-leaved deciduous species, on the bark of *Picea* sp., 04.07.2015, leg. Chesnokov S.V. (LE); near town Aldan, "Radiogora" (58°36'34.9"N, 125°22'025"E), on the bark of *Salix* sp., 04.07.2015, leg. Chesnokov S.V. (LE); 1 km to E from the river Delinda (58°46'20.4"N, 126°25'27.2"E), alt. 500 m (58°46'21"N, 126°25'27"E), alt. 536 m, fir forest near road, 12.07.2015, leg. Chesnokov S.V., Konoreva L.A. (LE); stream Lenskii, fir forest with larch (58°34'28"N, 125°32'7"E), 06.07.2015, leg. Konoreva L.A. (LE). KOBYAISK REGION, near rivers Sagandzhi and Dyanyshki (65°27'15"N, 127°0'38"E), fir forest, on the branches of *Picea* sp., 04.07.1985, leg. Volotovskii K.A. (SASY, Us 9). LENSKE REGION, near river Pilka (59°47'38"N, 113°48'14"E), larch forest with fir, on the branches of *Picea* sp. and *Larix* sp., 23.06.2002, leg. Egorova A.A. (SASY, Us 80); left bank of the river Lena, Talakanskoe oil and gas field (110°52'24" E, 59°46'00" N), larch forest with pine and birch, on the bark of *Betula* sp., deadwood (110°42'49" E, 59°55'5" N), pine forest with fox berry and soil lichens, 11.09.2014, 08.09.2014, leg. Chikidov I.I. (SASY, Us 42, Us 45, Us 46); border with Irkutsk Region, right bank of the river Vitim, 4 km downstream from the river Talaya (59°08'18"N, 112°40'52"E), mixed forest, on the bark of *Betula* sp., on the branches of *Picea* sp., (59°08'22"N, 112°41'21"E), fir forest, on the branch of *Picea* sp., 12.06.2004, leg. Poryadina L.N. (SASY, Us 23, Us 28, Us 29, Us 25). MIRNYI REGION, left bank of the river Ulahan-Botuobuya, 700 m below river Arbangda-Siene (61°22'9"N, 112°24'41"E), fir forest, trunk of the *Betula* sp., 15.08.2006, leg. Poryadina L.N. (SASY, Us 64, Us 65); reserve "Dzhunkun", fir forest, on the branches of *Picea* sp., 17.08.2006, leg. Poryadina L.N. (SASY, Us 21).

Usnea hirta (L.) W.H. Wigg.

Thallus shrubby, branched, base pale greenish or brownish, fibrils abundant, isidia numerous, papillae absent, soralia punctiform.

The main diagnostic features are its shrubby thallus, with numerous isidia and the absence of papillae.

Two chemotypes have been recorded: (1) medulla with squamatic and salazinic acids, cortex with usnic acid; (2) medulla without lichen substances, cortex with usnic acid.

The species was found in Aldan and Lensk regions (Fig. 1E).

Specimens examined: ALDAN REGION, stream Bezmyannyi (58°44'39.5"N, 126°21'47.3"E), forest with spruce, birch, larch, on the branch of *Alnus* sp., 11.07.2015, leg. Chesnokov S.V. (LE). LENSKE REGION, right bank of the river Vitim (59°08'22"N, 112°41'21"E), fir forest, on the branch of *Picea* sp., 13.06.2004, leg. Poryadina L.N. (SASY, Us 75).

Usnea lapponica Vain.

Thallus shrubby, branched, mainly anisotomic-dichotomous, base pale to blackened, fibrils abundant, isidia absent, papillae numerous, soralia large, becoming expanded and bracelet-like. The main diagnostic features are its shrubby, anisotomic-dichotomous branched thallus, with numerous papillae and the absence of isidia.

Three chemotypes have been recorded: (1) medulla with salazinic acids, cortex with usnic acid; (2) medulla with thamnolic acid, cortex with usnic acid; (3) medulla without lichen substances, cortex with usnic acid.

The lichenicolous fungus, *Lichenostigma maureri* Hafellner, was found on *U. lapponica*.

This species occurs in Aldan, Kobyaisk, Lensk, Mirnyi, Neryungri, Olenok, Olekminsk, Tomponsk regions (Fig. 1F).

Specimens examined: ALDAN REGION, right bank of the river Aldan (58°48'18"N, 128°09'18.5"E), larch forest with fir, *Picea* sp., 16.07.2015, leg. Poryadina L.N. (SASY, Us 86); right bank of the river Bol'shoi Nimnyr (58°02'26.0"N, 125°29'53.7"E), alt. 861 m, fir-pine-larch forest, 10.07.2015, leg. Chesnokov S.V. (LE); 1 km E from the river Delinda (58°46'21"N, 126°25'27"E), alt. 536 m, fir forest with birch and larch, 12.07.2015, leg. Konoreva L.A. (LE); stream Lenskii (58°34'27"N, 125°32'07.9"E), alt. 775 m, fir forest, on the bark of *Picea* sp. (58°34'28"N, 125°32'07.9"E), alt. 763 m, fir forest with larch and *Pinus pumila*, 06.07.2015, leg. Chesnokov S.V., Konoreva L.A. (LE). KOBYAISK REGION, river Dyanyshka, 30 km upper river Sagandzhi (65°19'20"N, 126°29'40"E), fir-larch-*Pinus pumila*-*Duschekia* sp. forest, fir forest, on the branches of *Picea* sp., 20.06.1985, 31.05.1985, leg. Volotovskii K.A. (SASY, Us 1, Us 11); near rivers Sagandzhi and Dyanyshki (65°27'15"N, 127°0'38"E), fir forest, on the branches of *Picea* sp., 04.07.1985, leg. Volotovskii K.A. (SASY, Us 10). LENSKE REGION, left bank of the river Lena, Talakanskoe oil and gas field (110°25'35"N, 59°24'42"E), fir-larch forest, on the branches of *Picea* sp., 08.09.2014, leg. Chikidov I.I., (SASY, Us 43, Us 44); near river Pilka (59°47'38"N, 113°48'14"E), larch forest with fir, on the branches of *Larix* sp. and *Picea* sp., 23.06.2002, leg. Egorova A.A. (SASY, Us 79); stream Lenskii (58°34'27.5"N, 125°32'07.9"E), alt. 775 m, fir forest, on the bark of fir, 06.07.2015, leg. Chesnokov S.V. (LE). MIRNYI REGION, left bank of the river Ulahan-Botuobuya, 700 m below river Arbangda-Siene (61°22'9"N, 112°24'41"E), fir forest, on the bark and branch *Picea* sp., 15.08.2006, leg. Poryadina L.N. (SASY, Us 66, Us 67). NERYUNGRIGI REGION, near lake Bolshoe Toko (55°59'55"N, 130°53'36"E), alt. 980–1040 m, fir forest with alder, on the trunk and branches of fir, on the trunk of *Alnus* sp., 29.08.1987, leg. Fes'ko N.N. (SASY,

Us 73). OLENEK REGION, left bank of the river Tyunga, below creek Sr. Salakuta (66°35'3"N, 115°50'28"E), larch-fir forest, 17.07.1957, leg. Dobretsova L.A. (SASY, Us 63). OLEKMINSK REGION, left bank of the river Biryuk (60°22'12"N, 119°29'25"E), fir forest, mixed forest, on the branches of *Picea* sp., *Larix* sp. and *Pinus* sp., 15.07.2008, 16.07.2008, 21.07.2008, leg. Poryadina L.N. (SASY, Us 14, Us 15, Us 17, Us 19, Us 20); right bank of the river Biryuk (60°22'12"N, 119°29'25"E), mixed forest, deadwood (*Picea* sp.), 16.07.2008, leg. Poryadina L.N. (SASY, Us 18); pipeline VSTO 1820-1833 km, stream Ozernyi (60°15'39"N, 121°42'31"E), alt. 449 m, pine forest with birch, *Pinus pumila*, on the bark of *Pinus* sp., 18.07.2006, leg. Isaev A.P. (SASY, Us 83). TOMPONSK REGION, river Tukuran, 20 km from orifice river Temirdeeh (63°57'41"N, 132°38'57"E), fir-larch forest, on the branches of *Picea* sp., 17.09.1990, leg. Akimova E.V. (SASY, Us 2); basin of the river Aldan, right bank of the river Tompo, near village Krest-Hal'dzhai (62°47'7"N, 134°37'30"E), fir forest, on the branches of *Picea* sp., 20.07.2010, leg. Zaharova V.I. (SASY, Us 22).

Usnea longissima Ach.

Thallus pendulous, long, base pale to blackened, the main stem covered with a persistent cortex. Primary branches with numerous fibrils, papillae absent or few, soralia punctiform, papillae absent or few. The main diagnostic features are its pendulous thallus, draping horizontal branches, and the main stem with a persistent cortex.

Three chemotypes have been recorded: (1) medulla with salazinic acids, cortex with usnic acid; (2) medulla with salazinic, barbatic acids, fatty acids, cortex with usnic acid; (3) medulla with salazinic, evernic, diffractaic acids, cortex with usnic acid.

The species occurs in Aldan and Neryungri regions (Fig. 1G).

Specimens examined: ALDAN REGION, Tokinskii Stanovik, basin of the river Algama, river Tarynnah (56°0'32"N, 129°39'52"E), mixed forest, on the branches of *Picea* sp., 19.07.2000, leg. Sofronova E.V. (SASY, Us 49). NERYUNGRI REGION, near lake Bol'shoe Toko (55°59'55"N, 130°53'37"E), alt. 980–1040 m, fir forest with *Duschekia* sp., on the trunk and branches of *Picea* sp., 29.08.1987, leg. Fes'ko N.N. (SASY, Us 71, Us 72); range Tokinskii Stanovik, northern macroslope, reserve "Bol'shoe Toko", near river Ivan (55°54'7"N, 130°46'20"E), fir forest, *Picea* sp., 07.07.1986, leg. Volotovskii K.A. (SASY, Us 50).

Usnea subfloridana Stirt.

Thallus shrubby to subpendent, branched, base blackened, fibrils present, isidia and papillae numerous, soralia typically punctiform, and bearing short numerous isidia. The main diagnostic features are its shrubby to subpendent thallus, punctiform soralia and the numerous isidia.

Three chemotypes have been recorded: (1) medulla with squamatic acid, cortex with usnic acid; (2) medulla with thamnolic acid, cortex with usnic acid; (3) medulla without lichen substances, cortex with usnic acid.

The lichenicolous fungus, *Lichenostigma maureri* Hafellner, was found on *U. subfloridana*.

The species is widespread in Sakha Republic and occurs in Aldan, Kobayask, Lensk, Neryungri, Olekminsk Regions (Fig. 1H).

Specimens examined: ALDAN REGION, right bank of the river Aldan (58°49'52.1"N, 127°42'45.6"E), fir-larch forest, on the branches of *Picea* sp., 21.07.2015, leg. Poryadina L.N. (SASY, Us 82); near town Aldan, bank of the river Bol'shoi Kuranah (58°38'33.6"N, 125°28'05.9"E), dark-coniferous forest and forest of small-leaved deciduous species, on the bark of *Picea* sp., 04.07.2015, leg. Chesnokov S.V. (LE); 1 km E from river Delinda (58°46'21"N, 126°25'27"E), fir forest with birch and larch, 12.07.2015, leg. Konoreva L.A. (LE); left bank of the river Chul'man (56°51'49"N, 124°54'14"E), alt. 636 m, poplar-willow forest with larch, 06.07.2015, leg. Konoreva L.A. (LE); stream Lenskii (58°34'28"N, 125°32'07.9"E), alt. 763 m, fir forest with larch and *Pinus pumila*, 06.07.2015, leg. Konoreva L.A. (LE). KOBAYASK REGION, orifice of the river Byrand'ya (66°13'49"N, 126°58'36"E), larch forest with poplar and chosonia, 06.08.1961, leg. Gruzdev P.V. (SASY, Us 81). LENSK REGION, right bank of the river Lena, near village Krestovaya (59°46'5"N, 113°18'1"E), fir-*Pinus pumila*-larch forest, on the branches of *Picea* sp., 30.06.1989, leg. Isaev A.P. (SASY, Us 3, Us 4, Us 6); orifice of the river Pilka (right bank of the river Lena) (60°7'21"N, 113°55'57"E), fir forest, on the branches of *Picea* sp. and *Larix* sp., leg. Egorova A.A. (SASY, Us 76, Us 77); left bank of the river Lena, Talakan-skoe oil and gas field (59°55'5"N, 110°42'49"E), fir-larch forest, on the bark of *Pinus* sp., deadwood, 08.09.2014, leg. Chikidov I.I. (SASY, Us 45, Us 47); border with Irkutsk Region, right bank of the river Vitim, 4 km downstream from the river Talaya (59°08'18"N, 112°40'52"E), mixed forest, deadwood, on the branches of *Picea* sp., 12.06.2004, leg. Poryadina L.N. (SASY, Us 26, Us 53, Us 62). NERYUNGRI REGION, near town Neryungri, near river Mal'yi Berkakit, larch forest, on the branches of *Larix* sp., 29.06.1976, leg. Perfil'eva V.I. (SASY, Us 59); near lake Bol'shoe Toko (55°59'55"N, 130°53'37"E), alt. 980–1040 m, fir forest with *Duschekia* sp., on the trunk and branches of *Picea* sp., on the trunk of *Duschekia* sp., 29.08.1987, leg. Fes'ko N.N. (SASY, Us 68, Us 69, Us 70). OLEKMINSK REGION, right bank of the river Biryuk (60°22'12"N, 119°29'25"E), mixed forest, deadwood of *Picea* sp., 16.07.2008, leg. Poryadina L.N. (SASY, Us 18); left bank of the river Biryuk (60°22'12"N, 119°29'25"E), fir forest, on the branches of *Picea* sp., 15.07.2008, leg. Poryadina L.N. (SASY, Us 16). TOMPONSK REGION, right bank of the river Vostochnaya Handyga, near village Teplyi Klyuch (62°46'384"N, 136°47'280"E), alt. 290 m, pine-fir forest, on the branches of *Picea* sp., 07.07.2011, leg. Poryadina L.N. (SASY, Us 48); river Tukuran, stream Tuora-Tukuran (63°57'41"N, 132°38'57"E), 06.09.1990, leg. Kirillina S.N. (SASY, Us 30); river Tukuran (63°57'41"N, 132°38'57"E), on the branches of *Larix* sp., 05.09.1990, leg. Kirillina S.N. (SASY, Us 40). HANGALASSK REGION, right bank of the river Lena, nature park "Lenskies stolby", on the branches of *Larix* sp., 18.06.1972, leg. Perfil'eva V.I. (SASY, Us 56).

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