

New records of lichens from the Zeysky Nature Reserve (Amur Region, Russia)

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Abstract: The lichen biota of the Zeysky Nature Reserve (southern Russian Far East) was studied in the course of geobotanical expedition. In total 36 species of lichens and one lichenicolous fungus are reported for the first time for the reserve. Among them 19 are new to the Amur Region. *Parmelia asiatica* is reported for the first time for the southern Russian Far East, *Cladonia norvegica* – for the Asian part of Russia, *Tuckermannopsis gilva* – for Russia, *Melanohalea laciniatula* – for Asia. Four species are included in the Red Data Book of Russian Federation.

Keywords: Russian Far East; *Cladonia norvegica*; *Melanohalea laciniatula*; *Parmelia asiatica*; *Tuckermannopsis gilva*

INTRODUCTION

There are a great number of publications devoted to lichens and allied fungi of the southern Russian Far East (incl. Amur Region, Jewish Autonomous Region, Primorye Territory, Sakhalin Region and Khabarovsk Territory in part). All available data were consolidated by Svetlana I. Tchabanenko in the lichen checklist of the southern Russian Far East (Tchabanenko, 2002), counting 943 species. In subsequent years more than 30 publications were added (e.g. Joneson, 2004; Pchelkin, 2008; Velikanov & Skirina, 2012; Ezhkin & Galanina, 2014; Zhurbenko, 2014; Skirina, 2015, 2016) about lichens in this area. However, lichen biota of the Amur Region has not been comprehensively studied. Most researchers have investigated lichens within three nature reserves – Norsky, Khingansky and Zeysky. The lists of lichens of Norsky and Khingansky reserves counted 308 (Pchelkin & Pchelkina, 2013) and 63 (Mikulin, 1998) species, respectively. Some results of lichenological investigations in the Zeysky Reserve were published in the last decades of 20th century (Petelin et al., 1981; Tolpysheva et al., 1981; Stetsura, 1986; Makryi & Stetsura, 1987; Tolpysheva & Zhiryakova, 1988, 1990; Guseva et al., 1993). The list of lichens compiled on the base of these publications counted 51 species only (Urbanavichus & Urbanavichene, 2004).

Current paper aims to improve our knowledge about lichen diversity of the Zeysky Nature Reserve – one of the least investigated reserves in the Russian Far East. Of 40 species presented here, 36 are recorded for the first time for the Zeysky Nature Reserve, Amur Region, Asian part of Russia, Russia or Asia. *Parmelia asiatica* is reported for the first time for the southern Russian Far East, *Cladonia norvegica* – for the Asian part of Russia, *Tuckermannopsis gilva* – for Russia, *Melanohalea laciniatula* – for Asia. Four species are included in the Red Data Book of Russian Federation (Red..., 2008). Thus, the list of species nowadays known in the Zeysky Nature Reserve has increased to 87 species. Considering the wide area of the reserve and high diversity of ecosystems and phorophytes in it, we can assume that this is only a small part of the real diversity of lichens. Obviously further investigation is urgently needed.

STUDY AREA

Zeysky Nature Reserve was established in 1963 and is located on the eastern part of the Tukuringra Ridge in the Amur Region of the Russian Far East. The reserve occupies 994 km². The 40% of this territory is under 700 m a.s.l., 35% – from 700 to 1000 m, 18% – from 1000 to

1300 m, and 7% – above 1300 m. The climate of the study area is continental, with monsoon features, it is characterized by long, severe winters (not very snowy) and warm summers. The average monthly temperatures range from -30.6°C in January to $+18.2^{\circ}\text{C}$ in July. The total annual precipitations are between 500 mm in foothills to more than 1500 mm in upper belts. More than 80% of them fall in summer months (Vasiljev et al., 1985).

There are three defined belts in vegetation. Above 1000 m a.s.l. elfinwoods [*Pinus pumila* (Pall.) Regel] and tundra with dwarf shrubs dominance grow. Taiga belt occupies altitudes between 300 to 1000–1200 m a.s.l. and consists of larch [*Larix gmelinii* (Rupr.) Rupr.] and spruce forests [*Picea ajanensis* (Lindl. & Gord.) Fisch. ex Carr.]. Hemiboreal larch and oak-black birch (*Quercus mongolica* Fisch. ex Ledeb., *Betula davurica* Pall.) forests with manchurian floristic complex occupy the warmest south-facing slopes (250–400 m a.s.l.) and are situated on the northern limit of their distribution.

MATERIALS AND METHODS

The materials for the present research were collected by Sergey V. Dudov in August and September 2016 during geobotanical investigations in the Zeysky Reserve and its vicinity (Fig. 1). Dissecting microscope, light microscope and UV light cabinet were used for the identification of lichen specimens. Voucher specimens are deposited mainly in the herbarium of Komarov Botanical Institute RAS (LE); some specimens are stored in the herbarium of Zeysky Nature Reserve (HerbZR). The species included in the Red Data Book of Russian Federation (Red..., 2008) are marked with *, lichenicolous fungus with #. Zeysky Reserve and Amur Region are abbreviated as ZR and AR, respectively. The nomenclature of the cited taxa mainly follows Nordin et al. (2011) and Esslinger (2016). The species in the list are accompanied by the data about localities, substrates, herbaria and references.

List of localities

Zeysky Reserve, Tukuringa Ridge: 1 – $54^{\circ}07'54.1''\text{N}$, $126^{\circ}43'44.4''\text{E}$, 583 m a.s.l., the valley of the right tributary of the Kamenushka River, near its mouth, spruce forest, 16.08.2016; 2 – $54^{\circ}07'51.2''\text{N}$, $126^{\circ}44'13.2''\text{E}$, 599 m a.s.l., fluvial terrace of the Kamenushka River,

sparse larch forest, 16.08.2016; 3 – $54^{\circ}09'22.0''\text{N}$, $126^{\circ}47'56.4''\text{E}$, 1299 m a.s.l., the main watershed of the ridge in the upper reaches of the Banny spring and Stepanak rivers, tundra with mosses and dwarf shrubs, 17.08.2016; 4 – $54^{\circ}09'46.8''\text{N}$, $126^{\circ}46'44.4''\text{E}$, 1268 m a.s.l., the main watershed of the ridge in the upper reaches of the Kamenushka River, tundra with dwarf shrubs, mosses and lichens, 18.08.2016; 5 – $53^{\circ}52'26.8''\text{N}$, $127^{\circ}06'50.4''\text{E}$, 503 m a.s.l., vicinity of cordon “20th km”, larch-birch forest, 22.08.2016; 6 – $53^{\circ}52'22.1''\text{N}$, $127^{\circ}06'54.0''\text{E}$, 498 m a.s.l., vicinity of cordon “Nizhny Chimchan”, peat bog with larches, 23.08.2016; 7 – $54^{\circ}14'59.3''\text{N}$, $126^{\circ}53'38.4''\text{E}$, 334 m a.s.l., right side of the Gilui River valley above the Razvedochny spring, larch forest with young spruces, 25.08.2016; 8 – $54^{\circ}15'03.6''\text{N}$, $126^{\circ}54'07.2''\text{E}$, 422 m a.s.l., left side of the Razvedochny spring valley, larch forest with birch, 26.08.2016; 9 – $54^{\circ}15'01.8''\text{N}$, $126^{\circ}54'7.2''\text{E}$, 403 m a.s.l., left side of the Razvedochny

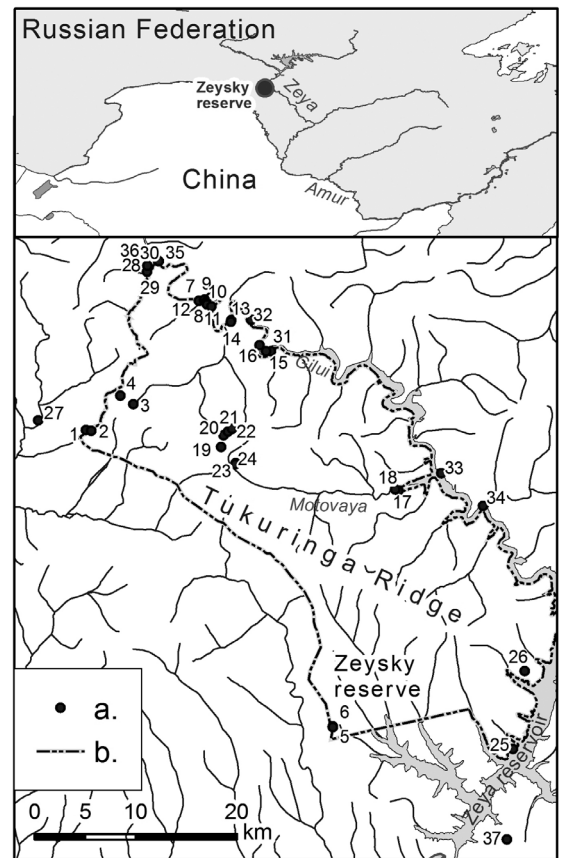


Fig. 1. A. Location of the study area; B. Collection sites within Zeysky Nature Reserve and in its vicinities: a – collection sites, b – border of the Zeysky Nature Reserve.

spring valley, aspen-birch-larch forest on rock debris, 26.08.2016; 10 – 54°14'54.6"N, 126°54'14.4"E, 373 m a.s.l., Razvedochny spring valley, sparse larch forest, 26.08.2016; 11 – 54°14'47.8"N, 126°54'21.6"E, 448 m a.s.l., left side of the Strelka spring valley, 1.5 km above the mouth, birch-larch forest, 26.08.2016; 12 – 54°14'42.4"N, 126°54'46.8"E, 353 m a.s.l., left side of the Strelka spring valley, near the mouth, birch-larch forest, 26.08.2016; 13 – 54°13'59.5"N, 126°56'38.4"E, 387 m a.s.l., right side of the Gilui River valley, below the mouth of the Stepanak River, larch-aspen-birch forest, 27.08.2016; 14 – 54°13'54.8"N, 126°56'34.8"E, 350 m a.s.l., right side of the Gilui River valley, below the mouth of the Stepanak River, screes of big rock fragments, 27.08.2016; 15 – 54°12'24.1"N, 127°00'18.0"E, 316 m a.s.l., the right bank of the Gilui Bay of the Zeya Reservoir near the cordon "Izubriny", sparse larch woodland, 30.08.2016; 16 – 54°12'42.8"N, 126°59'16.5"E, 320 m a.s.l., the right bank of the Gilui Bay of the Zeya Reservoir, 2 km above the cordon "Izubriny", meadow with dry birches, 30.08.2016; 17 – 54°05'08.9"N, 127°12'14.4"E, 333 m a.s.l., the right side of the Motovaya River valley, sparse larch woodland, 31.08.2016; 18 – 54°05'12.5"N, 127°11'56.4"E, 333 m a.s.l., Motovaya River valley, spruce-poplar forest, 31.08.2016; 19 – 54°07'50.2"N, 126°56'13.2"E, 1282 m a.s.l., the main watershed of the ridge in the upper reaches of the Motovaya River, birch elfinwood, 05.09.2016; 20 – 54°08'02.8"N, 126°56'38.4"E, 1376 m a.s.l., the main watershed of the ridge in the upper reaches of the Motovaya River, *Calamagrostis purpurea* (Trin.) Trin. meadow dominance, 05.09.2016; 21 – 54°08'11.4"N, 126°57'00.0"E, 1400 m a.s.l., the main watershed of the ridge in the upper reaches of the Motovaya River and the Burlivy spring, tundra with mosses and lichens, 05.09.2016; 22 – 54°07'12.7"N, 126°56'02.4"E, 1265 m a.s.l., the main watershed of the ridge in the upper reaches of the Bol'shaya Erakinga River, spruce forest, 06.09.2016; 23 – 54°06'22.0"N, 126°57'25.2"E, 860 m a.s.l., left side of the Motovaya River valley in the upper stream, aspen-birch-larch forest, 06.09.2016; 24 – 54°06'18.7"N, 126°57'21.6"E, 821 m a.s.l., left side of the Motovaya River valley in the upper stream, aspen-larch forest, 06.09.2016; 25 – 53°51'28.4"N, 127°23'09.6"E, 378 m a.s.l., cape in the Zeya Reservoir between the Razvedochny and Sukhoy gulfs, birch-larch forest, 09.09.2016; 26 – 53°55'08.4"N, 127°23'49.2"E, 334 m a.s.l., left side of the Beloborodovsky Bay, black birch-larch forest, 01.09.2016. **Vicinity of Zeysky Reserve, Tukuringa Ridge:** 27 – 54°08'19.3"N, 126°39'21.6"E, 491 m a.s.l., right side of the Obka River valley, 1.5 km above its mouth, birch-aspen forest, 15.08.2016; 28 – 54°16'28.0"N, 126°48'50.0"E, 398 m a.s.l., the valley of the left tributary of the Nizhny Chimchan River, birch forest with larches, 23.08.2016; 29 – 54°16'46.2"N, 126°48'50.4"E, 575 m a.s.l., vicinity of cordon "Nizhny Chimchan", birch forest with young spruces, 23.08.2016; 30 – 54°17'03.5"N, 126°49'48.0"E, 406 m a.s.l., left side of the Gilui River valley opposite the

mouth of the Nizhny Chimchan River, birch-larch forest, 24.08.2016; 31 – 54°12'23.4"N, 126°59'52.8"E, 315 m a.s.l., bank of the Gilui Bay of the Zeya Reservoir opposite the mouth of the Izubryna River, meadow with horsetail and reed, 28.08.2016; 32 – 54°14'02.8"N, 126°58'26.4"E, 319 m a.s.l., left bank of the Gilui Bay of the Zeya Reservoir opposite the mouth of the Zolotoy spring, sparse larch forest, 29.08.2016; 33 – 54°06'07.9"N, 127°16'04.8"E, 373 m a.s.l., left bank of the Gilui Bay opposite the mouth of the Motovaya River, sparse birch-larch forest with aspen, 31.08.2016; 34 – 54°04'25.7"N, 127°19'55.2"E, 336 m a.s.l., left bank of the Gilui Bay between the Lugerkan and Tabuneika rivers, larch-aspen forest, 01.09.2016; 35 – 54°17'02.4"N, 126°49'51.6"E, 414 m a.s.l., left side of the Gilui River valley opposite the mouth of the Nizhny Chimchan River, larch-spruce forest, 24.08.2016; 36 – 54°16'54.5"N, 126°49'12.4"E, 550 m a.s.l., vicinity of cordon "Nizhny Chimchan", larch forest with birch, 23.08.2016. **Vicinity of Zeysky Reserve:** 37 – 53°46'39.7"N, 127°22'44.4"E, 702 m a.s.l., the Soktahan Range, 5 km to the E of Zeya town, birch-larch forest, 21.08.2016.

THE SPECIES

- #ABROTHALLUS PARMELIARUM (Sommerf.) Arnold – 6, 10, thalli of *Melanohalea* spp. (HerbZR). – New to AR. Distribution in the Russian Far East: Jewish Autonomous Region, Chukotka Autonomous Okrug, Kamchatka Territory (Zhurbenko, 2014).
- BRYORIA AMERICANA (Motyka) Holien – 2, 10, 36, bark of birch and larch (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin, 2008; Pchelkin & Pchelkina, 2013), Primorye Territory (Skirina, 2016).
- BRYORIA NITIDULA (Th. Fr.) Brodo & D. Hawksw. – 3, soil (HerbZR). – New to AR. Distribution in the Russian Far East: Chukotka Autonomous Okrug (Makarova & Katenin, 2009), Kamchatka Territory (Himelbrant et al., 2014), Khabarovsk Territory, Magadan Region, Sakhalin Island (Kotlov, 1995; Tchabanenko, 2002).
- BRYORIA SIMPLICIOR (Vain.) Brodo & D. Hawksw. – 15, 31, twigs of larch (LE). – New to AR. Distribution in the Russian Far East: Chukotka Autonomous Okrug (Andreev et al., 1996), Kamchatka Territory (Mikulina, 1990), Khabarovsk Territory, Magadan Region, Primorye Territory (Kotlov, 1995; Tchabanenko, 2002; Skirina, 2016).
- CHRYSOTHRIX CHLORINA (Ach.) J.R. Laundon – 14, vertical surface of large stones (HerbZR).

- New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory, Primorye Territory (Tchabanenko, 2002; Skirina, 2016).
- CLADONIA ALINII Trass – 21, soil (LE). – New to AR. Distribution in the Russian Far East: Chukotka Autonomous Okrug (Andreev et al., 1996), Magadan Region (Kotlov, 1995), Khabarovsk Territory, Primorye Territory (Tchabanenko, 2002; Skirina, 2016).
- CLADONIA CRISPATA (Ach.) Flot. var. CRISPATA – 20, soil (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Primorye Territory, Khabarovsk Territory, Sakhalin and Paramushir islands (Tchabanenko, 2002; Skirina, 2016).
- CLADONIA CYANIPES (Sommerf.) Nyl. – 12, fallen wood (HerbZR). – New to AR. Distribution in the Russian Far East: Chukotka Autonomous Okrug (Makarova & Katenin, 2009), Jewish Autonomous Region (Skirina, 2015), Kamchatka Territory (Mikulin, 1988), Magadan Region (Kotlov, 1995), Primorye Territory (Tchabanenko, 2002).
- CLADONIA MACROPHYLLODES Nyl. – 4, soil (HerbZR). – New to AR. Distribution in the Russian Far East: Chukotka Autonomous Okrug (Andreev et al., 1996), Kamchatka Territory (Mikulin, 1988), Magadan Region (Kotlov, 1995), Primorye Territory (Tchabanenko, 2002).
- CLADONIA NORVEGICA Tønsberg & Holien – 13, 22, 37, base of trunks of larch and spruces (LE). – New to the Asian part of Russia. In Russia it is known in the Leningrad, Kaluga, Murmansk, Tver, Vologda regions and Republic of Komi (Urbanavichus & Urbanavichene, 2004; Fadeeva et al., 2007; Kuznetsova et al., 2007; Muchnik et al., 2009; Notov et al., 2011; Red..., 2015). World distribution: Europe, North and South America (Ahti et al., 2013) and Asia (Japan, closest to our locality) (Stenroos & Ahti 1994). *C. norvegica* is easily distinguished due to bright red spots on thallus, caused by mite infection. The closest taxon is *C. macilentata* Hoffm., which has the same secondary metabolites but differs in red colour of apothecia and pycnidia (Ahti et al., 2013).
- CLADONIA SULPHURINA (Michx.) Fr. – 26, soil (HerbZR). – New to AR. Distribution in the Russian Far East: Chukotka Autonomous Okrug (Makarova & Katenin, 2009), Jewish Autonomous Region (Skirina, 2015), Kamchatka Territory (Mikulin, 1987), Khabarovsk Territory (Velikanov & Skirina, 2012), Magadan Region (Kotlov, 1995), Sakhalin and Paramushir islands (Tchabanenko, 2002).
- *COCCOCARPIA ERYTHROXYLI (Spreng.) Swinscow & Krog – 9, stones (LE). – Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory (Skirina, 2013), Primorye Territory (Tchabanenko, 2002; Skirina, 2016), Sakhalin Island (Skirina et al., 2016).
- COLLEMA SUBNIGRESCENS Degel. – 13, 18, bark of aspen and twigs of spruce (LE). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory, Primorye Territory, Sakhalin and Kunashir islands (Tchabanenko, 2002; Skirina, 2016).
- IMSHAUGIA ALEURITES (Ach.) S.L.F. Mey. – 15, twigs of larch (LE). – New to AR. Distribution in the Russian Far East: Chukotka Autonomous Okrug (Andreev et al., 1996), Kamchatka Territory (Mikulin, 1990), Khabarovsk Territory, Magadan Region, Primorye Territory, Sakhalin Island (Kotlov, 1995; Tchabanenko, 2002; Skirina, 2016).
- LECANORA ALBELLULA (Nyl.) Th. Fr. – 10, bark of larch (HerbZR). – New to AR. Distribution in the Russian Far East: Kamchatka Territory (Neshataeva et al., 2007), Primorye Territory (Skirina, 2016).
- LEPTOGIUM AZUREUM (Sw.) Mont. – 33, base of aspen trunk, mossy stones and lignum (LE). – New to AR. Distribution in the Russian Far East: Primorye Territory (Tchabanenko, 2002).
- *LEPTOGIUM HILDENBRANDII (Garov.) Nyl. – 13, 24, 27-30, 34, bark of aspen (LE). – Distribution in the southern Russian Far East: Amur Region, Jewish Autonomous Region, Khabarovsk Territory, Primorye Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2015, 2016).
- LEPTOGIUM PSEUDOPAPILLOSUM P.M. Jørg. – 1, 8, 28, bark of aspen and willow (LE). – New to AR. In Russia it is known only in the

- Jewish Autonomous Region (Makryi, 2014; Skirina, 2015).
- **LOBARIA PULMONARIA* (L.) Hoffm. – 35, rock (HerbZR). – Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Primorye Territory, Khabarovsk Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2016).
- MELANOHALEA LACINIATULA* (Flagey ex H. Olivier) O. Blanco – 29, bark of birch (LE). – New to Asia. In Russia it is known only in Northern Caucasus (Slonov, 2002). Outside Russia occurs in Europe and northern Africa (Westberg & Thell, 2011).
- MYELOCHROA METAREVOLUTA* (Asahina) Elix & Hale – 5, 18, 24, 25, bark of aspen, birch and poplar (LE). – New to ZR. Distribution in the southern Russian Far East: Amur Region, Primorye Territory (Tchabanenko, 2002; Skirina, 2016), Sakhalin Island (Ezhkin & Galanina, 2014).
- **NEPHROMOPSIS LAURERI* (Kremp.) Kurok. – 19, 22, 23, bark of spruce and birch (LE). – Distribution in the southern Russian Far East: Amur Region, Jewish Autonomous Region, Khabarovsk Territory, Primorye Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2015, 2016).
- OXNERIA ULOPHYLLODES* (Räsänen) S.Y. Kondr. & Kärnefelt – 18, bark of poplar (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Primorye Territory (Tchabanenko, 2002).
- PARMELIA ASIATICA* A. Crespo & Divakar – 36, bark and twigs of larch (LE) (Fig. 2). – New to the southern Russian Far East. *P. asiatica* was described from China (Lumbsch et al., 2011) and soon after was recorded in the Kamchatka Peninsula and Irkutsk Region (Lishtva et al., 2013). In 2015, the third Russian locality was recorded from Magadan Region (Zheludeva, 2015). *P. asiatica* differs from the widespread and chemically close *P. sulcata* Taylor by the narrow sublinear lobes with sparse pseudocyphellae and spherical or hemispherical terminal and linear marginal soralia (Lishtva et al., 2013).
- PELTIGERA DIDACTYLA* (With.) J. R. Laundon – 16, 30, soil (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory, Primorye Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2016).
- PELTIGERA ELISABETHAE* Gyeln. – 4, 17, soil (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Primorye Territory, Khabarovsk Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2016).
- PELTIGERA NECKERI* Hepp ex Müll. Arg. – 32, soil (LE). – New to AR. Distribution in the Russian Far East: Jewish Autonomous Region (Skirina, 2015), Kamchatka Territory (Mikulín, 1987), Khabarovsk Territory, Primorye Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2016).
- PELTIGERA NEOPOLYDACTYLA* (Gyeln.) Gyeln. – 22, soil (HerbZR). – New to AR. Distribution in the Russian Far East: Kamchatka Territory (Himelbrant et al., 2014), Primorye Territory, Sakhalin Island (Tchabanenko, 2002).
- PELTIGERA PRAETEXTATA* (Flörke ex Sommerf.) Zopf – 13, bark of aspen (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory, Primorye Territory, Sakhalin and Shikotan islands (Tchabanenko, 2002; Skirina, 2016).
- PHAEOPHYSCIA HIRTELLA* Essl. – 13, bark of aspen (LE). – New to AR. Distribution in the Russian Far East: Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory, Primorye Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2016).

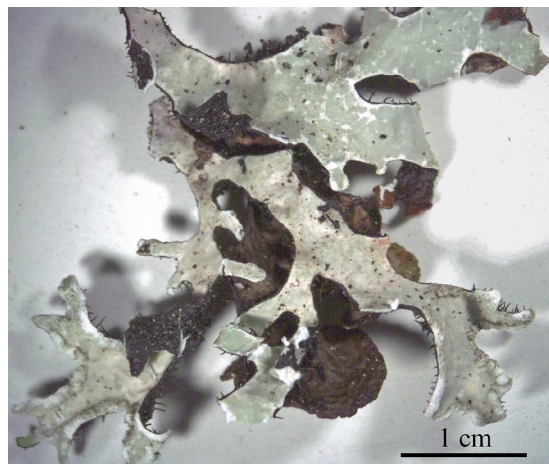


Fig. 2. Lobes of *Parmelia asiatica* with soralia.

- sian Far East: Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory (Tchabanenko, 2002), Primorye Territory (Skirin & Skirina, 2014).
- PHAEOPHYSCIA HIRTUOSA (Kremp.) Essl. – 13, 33, bark of aspen (LE). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin, 2008; Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Primorye Territory, Khabarovsk Territory, Sakhalin and Kunashir islands (Tchabanenko, 2002; Skirina, 2016).
- PHAEOPHYSCIA RUBROPULCHRA (Degelius) Essl. – 5, bark of birch (LE). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin, 2008; Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Primorye Territory, Khabarovsk Territory, Sakhalin and Kunashir islands (Tchabanenko, 2002; Skirina, 2016).
- PHYSCONIA GRUMOSA Kashiw. & Poelt – 1, 11, 18, 28, 30, bark of aspen, poplar and willow (LE). – New to AR. Distribution in the Russian Far East: Jewish Autonomous Region (Skirina, 2015), Kamchatka Territory (Himmelbrant et al., 2009), Primorye Territory (Tchabanenko, 2002; Skirina, 2016), Sakhalin Island (Ezhkin, Galanina, 2014).
- PLATISMATIA INTERRUPTA W. L. Culb. & C. F. Culb. – 22, bark of birch (LE). – New to AR. Distribution in the Russian Far East: Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory, Primorye Territory, Sakhalin and Kunashir islands (Tchabanenko, 2002; Skirina, 2016).
- RAMALINA POLLINARIA (Westr.) Ach. – 30, rock (HerbZR). – New to AR. Distribution in the Russian Far East: Jewish Autonomous Region (Skirina, 2015), Khabarovsk Territory, Primorye Territory, Sakhalin Island (Tchabanenko, 2002; Skirina, 2016).
- RINODINA DEGELIANA Coppins – 2, bark of larch (HerbZR). – New to AR. Distribution in the Russian Far East: Jewish Autonomous District (Skirina, 2015), Kamchatka Territory (Himmelbrant & Stepanchikova, 2011), Primorye Territory (Skirina, 2016), Sakhalin Island (Skirina et al., 2016).
- RINODINA XANTHOPHAEA (Nyl.) Zahlbr. – 2, 7, bark of larch and spruce (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region, Jewish Autonomous Region, Khabarovsk Territory, Primorye Territory, Sakhalin Island (Pchelkin, 2008; Pchelkin & Pchelkina, 2013; Urbanavichene & Skirina, 2011; Skirina, 2015, 2016), Kunashir Island (Tchabanenko, 2002).
- SCOLICIOSPORUM CHLOROCOCCUM (Graewe ex Stenh.) Vězda – 19, 37, bark of birch (HerbZR). – New to ZR. Distribution in the Southern Russian Far East: Amur Region (Pchelkin & Pchelkina, 2013), Jewish Autonomous Region (Skirina, 2015), Primorye Territory (Skirina et al., 2009; Skirina, 2016).
- TRAPELIOPSIS GRANULOSA (Hoffm.) Lumbsc – 4, soil, plant debris (HerbZR). – New to ZR. Distribution in the southern Russian Far East: Amur Region (Pchelkin, 2008; Pchelkin & Pchelkina, 2013), Khabarovsk Territory (Tchabanenko, 2002).
- TUCKERMANNOPSIS GILVA (Asahina) M. J. Lai – 22, bark of birch [*Betula lanata* (Regel) V. N. Vassil.] (LE) (Fig. 3). – New to Russia. World Distribution: Japan (Kärnefelt & Thell, 2001) and North Korea (Jeon et al., 2009). There are two more sorediate species known in the genus – *T. chlorophylla* (Willd.) Hale and *T. ulophylloides* (Asahina) M.J. Lai. The former taxon is widespread in the Northern Hemisphere while the latter is recorded from Japan and China (Lai, 1980, 2009) only. *T. gilva* is distinguished from *T. ulophylloides* by lacking cilia, and from *T. chlorophylla* by positive (rose) reaction with KC (alectoronic acid) (Kärnefelt & Thell, 2001).



Fig. 3. Thallus of *Tuckermannopsis gilva*.

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