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NEW SPECIES OF MACROMYCETES FOR REGIONS OF THE RUSSIAN FAR EAST. 4

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The paper continues a series of publications devoted to the new finds of macrofungi (*Ascomycota*, *Basidiomycota*) in regions of the Russian Far East. A total of 77 species of macromycetes are reported for the first time from 7 administrative units of the Russian Far East: Amur Oblast, Jewish Autonomous Oblast, Magadan Oblast, Sakhalin Oblast, Kamchatka Krai, Khabarovsk Krai and Primorskiy Krai. 13 species are reported as the first records for the Russian Far East, and 4 (*Calycina subtilis*, *Cistella fugiens*, *Lachnum roridum* and *Lasiobelonium horridulum*) are new for Russia. For some of the rare species, notes are given about the main differences in morphology and ecology, about the features of distribution. The identification of *Jahnoporus brachiatus* is confirmed by molecular genetic data, and this specimen was isolated into pure culture. The material was deposited in ABGI, LE, MAG, SVER, TOB, VLA herbaria as well as in the Yu. Rebriev (YuR) and A. Shiryaev (Shiryaev) personal collections.

Keywords: Ascomycota, *Basidiomycota*, biodiversity, fungal distribution, rare species, Russia

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INTRODUCTION

The paper is a third in the series of publications devoted to the new finds of macrofungi in the regions of the Russian Far East (Rebriev et al., 2020, 2021, 2022b). The data contained in these publications are deposited on the GBIF resource (Rebriev et al., 2022a, 2023a, b).

Each annotated record provides details about specimen ecology and collection information: locality, habitat, substrate, specimen herbarium numbers, collectors and identifiers as well as notes on rarity and peculiar features of some species.

MATERIALS AND METHODS

Material was collected and identified by Anna V. Bogacheva (abbreviated as AB), Nadezhda V. Bukharova (NB), Elena A. Erofeeva (EE), Vladimir I. Kapitonov (VK), Natalia A. Kochunova (NK), Eugene S. Popov

(EP), Nadezhda V. Psurtseva (NP), Yury A. Rebriev (YuR), Nina A. Sazanova (NS), Anton G. Shiryaev (AS) and others, as indicated in the text. If the specimen was collected and determined by the same specialist, such notes as "coll. and det." are ommitted in the text. The coordinates may be indicated less accurately for samples with incomplete data on the label. The taxa names are actualized in accordance with the Index Fungorum database (2023).

The identification was carried out mainly by morphological methods. One species, *Jahnoporus brachiatus*, is confirmed by molecular genetic method, and this specimen was isolated into pure culture and preserved in the Komarov Botanical Institute Basidiomycetes Culture Collection (LE-BIN). The material was accessioned in ABGI (Blagoveshchensk), LE F (Saint Petersburg), MAG (Magadan), SVER (Ekaterinburg), TOB (Tobolsk), VLA (Vladivostok) herbaria, as well as in the A. Shiryaev and Yu. Rebriev (YuR) personal collections.

The novelty of finding the species in the region was assessed on the analysis of numerous publications. The main source of information for agaricoid and boletoid taxa is a cumulative checklist summarized the majority of published data on the distribution of agaricoid and boletoid fungi in Russia since 1824 (Bolshakov et al., 2021). One else important source of information about species finds is Global Biodiversity Information Facility (https://www.gbif.org).

RESULTS

Ascomycota

Helotiales

Albotricha acutipila (P. Karst.) Raitv. – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Nikolaevskiy District, valley of Kady river, 51.85°N, 140.78°E, broad-leaved forest, on dead stems of *Poa* sp., 02.08.2005, AB (VLA D-3209).

Notes: On the mainland of the Russian Far East, this species was found for the first time, before that it was recorded only on the territory of the Sakhalin region (Raitviir, 1991; Bogacheva, 2012).

A. albotestacea (Desm.) Raitv. – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Ulchskiy District, valley of Salasu river, 51.15°N, 138.88°E, broad-leaved forest, on dead stems of *Poa* sp., 08.07.2005, AB (VLA D-3196).

Amicodisca virella (P. Karst.) Huhtinen – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Ulchskiy District, valley of Yai river, 51.24°N, 139.82°E, broad-leaved forest, on dead wood of *Quercus mongolica*, 30.07.2005, AB (VLA D-3670).

Calycina subtilis (Fr.) Baral – new for Russia.

Specimens examined: *Khabarovsk Krai*: Sovetsko-Gavanskiy District, Botcha Nature Reserve, 48.1037°N, 139.1781°E, *Abies* sp. forest, floodplain of the stream Teply, on fallen needles of *Abies* sp., 12.06.2021, AB (VLA D-4542); *Prymorskiy Krai*: Shkotovskiy District, upper reaches of the Steclyanuha river, 43.20°N, 132.28°E, floodplain forest, on leaves of *Populus* sp., 11.06.2017, AB (VLA D-4106).

Cistella fugiens (W. Phillips) Matheis – new for Russia.

Specimens examined: *Khabarovsk Krai*: Nikolaevskiy District, valley of Kady river, 51.85°N, 140.78°E, broad-leaved forest, on dead wood of *Salix* sp., 02.08.2005, AB (VLA D-3676); Sovetsko-Gavanskiy District, Botcha Nature Reserve, valley of Mulpa river, 48.10°N, 139.17°E, floodplain *Salix* spp. forest, on leaves of *Spiraea* sp., 19.08.2017, AB (VLA D-4104).

Dasyscyphella nivea (R. Hedw.) Raitv. – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Nikolaevskiy District, valley of Chernaya river, 51.89°N, 141.08°E, broad-leaved forest, on dead wood of *Fraxinus* sp., 03.08.2005, AB (VLA D-3681).

Hyaloscypha herbarum Velen. – new for Russian Far East.

Specimens examined: *Khabarovsk Krai*: Nikolaevskiy District, valley of Muty river, 50.55°N, 140.06°E, broad-leaved forest, on leaves of *Salix* sp., 02.08.2005, AB (VLA D-3683).

Lachnum caricis (Desm.) Höhn. – new for Russian Far East.

Specimens examined: *Khabarovsk Krai*: Ulchskiy District, valley of Yai river, 51.24°N, 139.82°E, broad-leaved forest, on dead leaves of C*arex* sp., 02.08.2005, AB (VLA D-3223).

L. nudipes (Fuckel) Nannf. – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Ulchskiy District, valley of Yai river, 51.24°N, 139.82°E, broad-leaved forest, on stems of *Apiaceae*, 30.07.2005, AB (VLA D-3188).

Notes: On the mainland of the Russian Far East, this species was found for the first time, before that it was recorded only on the territory of the Sakhalin region (Bogacheva, 2012).

L. rhytismatis (W. Phillips) Nannf. – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Ulchskiy District, valley of Yai river, 51.24°N, 139.82°E, broad-leaved forest, on dead wood of *Abies* sp., 30.07.2005, AB (VLA D-3206).

Notes: On the mainland of the Russian Far East, this species was found for the first time, before that it was recorded only on the territory of the Sakhalin region (Bogacheva, 2012).

L. roridum (Wallr.) Rehm – new for Russia.

Specimens examined: *Khabarovsk Krai*: Ulchskiy District, valley of Yai river, 51.24°N, 139.82°E, broad-leaved forest, on stems of *Rubus* sp., 31.07.2005, AB (VLA D-3201).

L. sesleriae (Svrček) Baral – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Nikolaevskiy District, valley of Kady river, 51.85°N, 140.78°E, broad-leaved forest, on dead stems of *Poa* sp., 02.08.2005, AB (VLA D-3215); Nikolaevskiy District, valley of Chernaya river, 51.89°N, 141.08°E, broad-leaved forest, on dead branches of *Calamagrostis* sp., 03.08.2005, AB (VLA D-D-3175).

Notes: On the mainland of the Russian Far East, this species was found for the first time, before that it was recorded only on the territory of the Sakhalin region (Bogacheva, 2012).

Lasiobelonium horridulum (Desm.) Dougoud – new for Russia.

Specimens examined: *Khabarovsk Krai*: Ulchskiy District, valley of Yai river, 51.24°N, 139.82°E, broad-leaved forest, on dead stems of *Poa* sp., 30.07.2005, AB (VLA D-3187, D-3178, D-3217).

Psilachnum inquilinum (P. Karst.) Dennis – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Nikolaevskiy District, valley of Kady river, 51.85°N, 140.78°E, broad-leaved forest, on dead stems of *Equisetum* sp., 03.08.2005, AB (VLA D-3697); Ulchskiy District, valley of Yai river, 51.24°N, 139.82°E, broad-leaved forest, on dead stems of *Equisetum* sp., 30.07.2005, AB (VLA D-3696, D-3656).

Hypocreales

Hydropisphaera peziza (Tode) Dumort. – new for Russian Far East.

Specimen examined: *Kamchatka Krai*: Bystrinskiy District, Bystrinskiy Nature Park, vicinity of Esso village, riverbank near the bridge across the Bystraya river, 55.9242°N, 158.7154°E, floodplain *Populus* sp. and *Chosenia* sp. forest, on rotten wood of *Populus maximowiczii*, 11.08.2005, EP (LE 235767).

Xylariales

Hypomontagnella submonticulosa (Y.M. Ju et J.D. Rogers) Sir, L. Wendt et C. Lamb. – new for Russian Far East.

Specimens examined: *Primorskiy Krai*: Shkotovskiy District, Ussuriskiy Nature Reserve, Suvorovskoye forestry, valley of the Suvorovka river near the Peishula ranger station, 43.6382°N, 132.5542°E, riverine broad-leaved forest, on wood of a snag of *Fraxinus* sp., 20.08.2020, EP (LE 324263).

Notes: Two Russian records of *H. submonticulosa* were previously known from North Ossetia–Alania (Cherepanov, 1989, as *Hypoxylon investiens* (Schwein.) M.A. Curtis) and Rostov Oblast (Akulov et al., 2008). This is the first record of this species from Asiatic part of Russia.

Hypoxylon cyanescens Hai X. Ma, Lar.N. Vassiljeva et Yu Li – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Nanayskiy District, Anyuyskiy National Park, mouth of Solomi brook, 49.3576°N, 137.5585°E, broad-leaved forest, on dead branches of a hardwood, 08.06.2010, coll. EE, det. Lar. Vasilyeva (LE 324176).

Notes: A rare species reported previously from Amur Oblast and Primorskiy Krai (Vasilyeva et al., 2013).

Basidiomycota

Agaricales

Amanita battarrae (Boud.) Bon – new for Jewish Autonomous Oblast and for Khabarovsk Krai.

Specimens examined: *Jewish Autonomous Oblast*: Birobidzhanskiy District, 17th km of Birshosse road, 48.6976°N, 132.7989°E, broad-leaved forest, on soil, 03.08.2013, EE (VLA M-24257); Smidovichskiy District, Cluster Zabelovsky of the Bastak Nature Reserve, northern shore of Zabelovskoe lake, 48.4332°N, 134.2224°E, deciduous forest, on soil, 04.08.2015, EE (VLA M-24740); *Khabarovsk Krai*: Nanayskiy District, Anyuysky National Park, 55th km of Lidoga – Vanino road, 49.4672°N, 137.5998°E, broad-leaved with *Pinus koraiensis* forest, on soil, 21.08.2014, EE (VLA M-24611).

Notes: This species was previously pointed as *A. ceciliae* (Erofeeva, Bulakh, 2015b; Erofeeva, Bulakh, 2016; Erofeeva et al., 2019).

A. olivaceogrisea Kalamees – new for Russian Far East.

Specimens examined: *Magadan Oblast*: Olskiy District, Zavyalov Island, right bank of the Malaya Rechka stream, 59.0750°N, 150.6463°E, forest with *Betula lanata* and *Duschekia fruticosa*, on soil, 13–16.08.2019, NS (MAG 5788, MAG 5669).

Notes: The species is typical for subalpine alder-birch forests of Europe (Funga Nordica, 2012). Morphologically similar to variable *A. vaginata*. The defining difference is the dominance of spherocysts rather than hyphae in the universal veil.

Arrhenia auriscalpium (Fr.) Fr. – new for Russian Far East.

Specimens examined: *Magadan Oblast*: Olskiy District, Zavyalov Island, western steep slope of Rassvet Bay, 59.0807°N, 150.6368°E, rocky seaside slope with fragments of herbs, on dense soil with small green mosses, 26.07.2021, coll. E. Zheludeva, det. NS (MAG 5806; fig. 1a).

A. obscurata (D.A. Reid) Redhead, Lutzoni, Moncalvo et Vilgalys – new for Russian Far East.

Specimens examined: *Magadan Oblast*: Olskiy District, mouth of the Ola River, 59.5631°N, 151.2769°E, silty-sandy wet area with *Rhodiola integrifolia* and *Carex* spp., on soil with small mosses, 29.05.2022, coll. O. Mochalova, det. NS (MAG 5880).

A. velutipes (P.D. Orton) Redhead, Lutzoni, Moncalvo et Vilgalys – new for Russian Far East.

Specimens examined: *Magadan Oblast*: Olskiy District, Spafaryev Island, northern part, 59.1510°N, 149.0032°E, tundra above the lighthouse, on bare ground under *Salix sphenophylla*, 20.07.2013, NS (MAG 3971).

Bogbodia uda (Pers.) Redhead – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Verkhnebureinskiy District, upper reaches of Samyr river, 52.2571°N, 134.2887°E, *Picea* sp.-dominated forest with *Pinus pumila* and *Larix dahurica*, on dead wood and litter, 31.08.2013, coll. EE, det. E. Bulakh (VLA M-24296).

Chromosera cyanophylla (Fr.) Redhead, Ammirati et Norvell – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Nanayskiy District, Anyuysky National Park, valley of Anyui river, middle part, 49.3750°N, 137.7117°E, mixed forest, on litter, 14.09.2012, EE (VLA M-24434; fig. 1b).

Notes: This species was previously pointed as *Chrysomphalina chrysophylla* (Erofeeva, Bulakh, 2015a).

Clavulinopsis umbrinella (Sacc.) Corner – new for Kamchatka Krai.

Fig. 1. Fruiting bodies of some rare species of macromycetes: a – *Arrhenia auriscalpium* MAG 5806 (photo by N. Sazanova); b – *Chromosera cyanophylla* VLA M-24434 (photo by E. Erofeeva); c – *Entocybe turbida* VLA M-24307 (photo by E. Erofeeva); d – *Lignomyces vetlinianus* ABGI 1292/157446 (photo by N. Kochunova); e – *Jahnoporus brachiatus* LE F-347957 (photo by N. Psurtseva); f – *Russula pascua* MAG 5843 (photo by N. Sazanova).

Specimens examined: *Kamchatka Krai*: Petropavlovskiy District, Khalakhtyrsky beech, 10 km east of Petropavlovsk city, 52.9997°N, 158.8610°E, meadow, on litter, 08.09.2015, AS (Shiryaev 1489-15).

Clitocybe metachroa (Fr.) P. Kumm. – new for Magadan Oblast.

Specimens examined: *Magadan Oblast*: vicinity of Magadan city, Nagaevskaya hill, 59.5664°N, 150.7412°E, thickets of *Duschekia fruticosa*, roadside, on soil, 18.08.2022, NS (MAG 5907); Olskiy District, Magadan Nature Reserve, Kava-Chelomdzhinskiy section, cordon Moldot, 60.0183°N, 148.0362°E, mixed *Larix-Betula* forest, on the litter-covered soil, 22.08.2017, NS (MAG 5062).

Cortinarius trivialis J.E. Lange – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: Bastak Nature Reserve, Dubovaya Sopka hill, 48.9066°N, 132.8747°E, mixed forest, on soil, 15.09.2022, EE (VLA M-27836).

Entocybe turbida (Fr.) T.J. Baroni, V. Hofst. et Largent – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Verkhnebureinskiy District, upper reaches of Samyr river, 52.2571°N, 134.2887°E, bog with *Larix* sp., *Pinus pumila* and shrub *Betula* spp., among green moss and sphagnum, 30.08.2013, coll. EE, det. E. Bulakh (VLA M-24307; fig. 1c).

Hygrophorus speciosus Peck – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: Bastak Nature Reserve, valley of Bastak river, 49.0250°N, 133.0293°E, boggy *Abies* sp.-dominated forest with *Pinus koraiensis* and *Larix* sp., on soil, 12.09.2022, EE (VLA M-27833).

Lignomyces vetlinianus (Domański) R.H. Petersen et Zmitr. – new for Amur Oblast and for Khabarovsk Krai.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, vicinity of cordon Antonovskaya, 52.8362°N, 130.1155°E, mixed forest, on dead trunk of *Populus tremula*, 18.07.2019, NK (ABGI 1292/157446; fig. 1d); *Khabarovsk Krai*: Komsomolskiy District, Komsomolsk Nature Reserve, valley of Zolotoy brook, 50.8797°N, 137.4492°E, mixed forest, on wood of *Populus tremula*, 02.09.1985, E. Bulakh (VLA M-781); Verkhnebureinskiy District, Bureya Nature Reserve, bank of Bureya river near cordon "Strelka", 51.6430°N, 134.2569°E, *Populus suaveolens* forest, on log of *P. suaveolens*, 23.07.2008, coll. EE, det. E. Bulakh (VLA M-21921); Nanayskiy District, Anyuysky National Park, middle part of Anyui river, southern slope of the hill, 49.3784°N, 137.7168°E, mixed forest, on dead trunk of deciduous tree, 25.08.2010, coll. EE, det. E. Bulakh (VLA M-22885).

Notes: The specimens VLA M-21921 and VLA M-22885 were pointed as *Lentinus martianoffianus* in Bulakh et al., 2010 and in Erofeeva, Bulakh, 2015a, respectively.

Limacellopsis guttata (Pers.) Zhu L. Yang, Q. Cai et Y.Y. Cui – new for Jewish Autonomous Oblast and for Khabarovsk Krai.

Specimens examined: *Jewish Autonomous Oblast*: Bastak Nature Reserve, Dubovaya Sopka hill, 48.9771°N, 132.8909°E, deciduous forest, on soil covered by a thick layer of litter, 15.09.2022, EE (VLA M-27969); *Khabarovsk Krai*: Amurskiy District, left bank of Tunguska river, 48.5978°N, 134.6922°E, *Quercus mongolica*-dominated forest, on soil, 07.09.2017, EE (VLA M-27975).

Mallocybe agardhii (N. Lund) Matheny et Esteve-Rav. – new for Magadan Oblast.

Specimens examined: *Magadan Oblast*: Tenkinskiy District, Orotuk station, upper part of Kolyma river, 62.0582°N, 148.6044°E, steppe slope with thyme, on soil, 25.07.2011, NS (MAG 3265).

Pholiota lundbergii Jacobsson – new for Russian Far East.

Specimens examined: *Magadan Oblast*: Magadan city, Oktyabrskaya street, 59.5620°N, 150.7823°E, sports ground of school No. 21, on compacted soil, 08.09.1998, NS (MAG 1133); ibid., 31.08.2000, NS (MAG 1788); Magadan city, microdistrict Nagaevo, 59.5613°N, 150.7853°E, wasteland, on soil, 02.09.2006, NS (MAG 1791); Magadan city, Portovaya street 18, 59.5648°N, 150.7843°E, lawn around the Institute of Biological Problems of the North, on soil, 30.08.2002, NS (MAG 1798); ibid., 03.09.2002, NS (MAG 1799); Magadan city, Gorky proezd, 59.5653°N, 150.8085°E, square, on soil, 03.09.1998, coll. K. Regel, det. NS, (MAG 1134); Magadan city, microdistrict Pioneerniy, 59.6182°N, 150.8060°E, road to garden, on soil, 23.08.2006, coll. V. Ulyanova, det. NS, (MAG 1789); Olskiy District, Armanskiy pass, 59.6973°N, 150.3858°E, dirt road side, on pebble-sandy soil, 27.09.2019, NS (MAG 5190).

Pleurocybella porrigens (Pers.) Singer – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Sovetsko-Gavanskiy District, Botcha Nature Reserve, Solonchakovyy brook, 48.3052°N, 139.5781°E, coniferous forest with *Picea* sp., *Abies* sp., on fallen trunk of *Abies* sp., 24.08.2008, E. Bulakh (VLA M-21670); Verkhnebureinskiy District, Bureya Nature Reserve, bank of Bureya river near cordon "Strelka", 51.6430°N, 134.2569°E, mixed forest, on fallen trunk of *Abies* sp., 11.06.2008, coll. EE, det. E. Bulakh (VLA M-21909).

Notes: The specimen VLA M-21670 was pointed as *Tapinella panuoides* (Bulakh, 2013), and the specimen VLA M-21909 was pointed as *Cheimonophyllum candidissimum* (Bulakh et al., 2010).

Pluteus rangifer Justo, E.F. Malysheva et Bulyonk. – new for Magadan Oblast.

Specimens examined: *Magadan Oblast*: vicinity of Magadan city, Novaya Veselaya, valley of Kedrovyy Klyuch brook, 59.5228°N, 150.8977°E, anthropogenic site, on soil with rotten wood of *Dushekia fruticosa* and *Betula lanata*, 06.08.2018, NS (MAG 5700).

Porodisculus pendulus (Fr.) Murrill – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Tambovskiy district, near the village of Muravyovka, Muravyovskiy Nature Park, 49.8729°N, 127.7038°E, *Quercus*-dominated forest, on dead trunk of *Quercus mongolica*, 05.06.2020, NK (ABGI 1451/156107).

Porotheleum fimbriatum (Pers.) Fr. – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Kunashir Island, vicinities of Tretyakovo village, 43.9938 °N, 145.6611°E, *Abies-Picea* forest, on dead wood, 28.08.2016, coll. E. Bulakh, det. NB (VLA M- 25227).

Schizophyllum commune Fr. – new for Magadan Oblast.

Specimens examined: *Magadan Oblast*: Olskiy District, Spafaryev Island, Bering Bay, 59.1520°N, 149.0086°E, lighthouse territory, stack of timber imported from Primorye, on dead wood of *Betula* sp., 25.07.2013, NS (MAG 3970).

Strobilurus stephanocystis (Kühner et Romagn. ex Hora) Singer – new for Russian Far East.

Specimens examined: *Khabarovsk Krai*: Verkhnebureinskiy District, Chegdomyn town, park, 51.1317°N, 133.0411°E, lawn, on litter, 01.05.2009, coll. EE, det. E. Bulakh (VLA M-27639); *Amur Oblast*: Svobodnenskiy District, vicinity of Yukhta-3 village, 51.4825°N, 128.1524°E, *Pinus sylvestris*-dominated mixed forest with *Betula platyphylla*, on soil (buried pinecones?) under *Pinus sylvestris*, 30.05.2022, VK (TOB 1760877).

Tricholoma frondosae Kalamees et Shchukin – new for Russian Far East.

Specimens examined: *Jewish Autonomous Oblast*: Obluchenskiy District, 10 km north-east from Bira town, local hill, 49.0675°N, 132.5575°E, *Quercus mongolica*-dominated forest with *Populus tremula*, *Pinus koraiensis* and *Betula* spp., on soil, 10.09.2016, EE (VLA M-26880).

Auriculariales

Heteroradulum kmetii (Bres.) Spirin et Malysheva – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Selemdzhinskiy district, Nora Nature Reserve, vicinity of cordon Meun, 52.9691°N, 130.1228°E, forest with dominance of *Populus* sp., *Picea* sp., on dead wood of *Populus* sp., 08.07.2020, NK (ABGI 2058/156114).

Boletales

Boletinus glandulosus Peck – new for Khabarovsk Krai.

Specimens examined: *Khabarovsk Krai*: Vaninskiy District, vicinities of Oktyabrskiy town, 49.0489°N, 140.2674°E, coniferous forest with *Picea* sp., *Abies* sp., on soil under *Abies nephrolepis*, 28.08.1973, E. Bulakh (VLA M-7745); Sovetsko-Gavanskiy District, Botcha Nature Reserve, Solonchakovyy brook, 48.3052°N, 139.5781°E, coniferous forest with *Picea* sp., *Abies nephrolepis*, on soil under *A. nephrolepis*, 21.08.2008, E. Bulakh (VLA M-21396); ibid., coniferous forest with *Picea* sp., *Abies nephrolepis*, on soil under *A. nephrolepis*, 06.08.2007, E. Bulakh (VLA M-21425); ibid., *Abies nephrolepis*-dominated forest, on soil under *A. nephrolepis*, 19.06.2008, E. Bulakh (VLA M-21397).

Notes: Specimens from Botcha Nature Reserve were pointed as *Suillus tridentinus* (Bres.) Singer (Bulakh, 2013).

B. spectabilis (Peck) Murrill – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: Bastak Nature Reserve, valley of Bastak river, 49.0250°N, 133.0293°E, *Larix* sp.-dominated forest with *Pinus koraiensis*, on soil, 12.09.2022, EE (VLA M-27834).

Boletus paluster Peck – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: Bastak Nature Reserve, valley of Bastak river, 49.0250°N, 133.0293°E, mixed forest, on buried wood among green moss, 12.09.2022, EE (VLA M-27835).

Notes: Morphologically and ecologically similar *Suillus ochraceoroseus* (Snell) Singer differs quite distinctly in the field by its hymenophore with angular pores only up to 2–3 mm wide and relatively somewhat thicker stipe (Zvyagina et al., 2022).

Scleroderma furfuraceum Rebriev et Zvyagina – new for Khabarovsk Krai and for Sakhalin Oblast.

Specimens examined: *Khabarovsk Krai*: Bolshekhekhtsirsky Nature Reserve, Bykov River valley, 48.27°N, 134.83°E, broad-leaved forest, on soil, 19.08.1983, coll. E. Bulakh, det. YuR (VLA M-21144); Komsomolsk Nature Reserve, Siu-Taru brook basin, 50.82°N, 137.53°E, mixed forest, on soil, 20.08.1985, coll. E. Bulakh, det. YuR (VLA M-21110); *Sakhalin Oblast*: Yuzhno-Kurilsky Urban Okrug, Kunashir Island, vicinity of Tretyakovo village, 43.99°N, 145.64°E, on humified wood, 28.08.2016, coll. E. Bulakh, det. YuR (VLA M-25607); Kunashir Island, Golovnin volcano, 43.84°N, 145.50°E, on soil, 29.08.2016, coll. E. Bulakh, det. YuR (VLA M-25615).

Notes: The specimen VLA M-21144 was pointed as *S. citrinum* Pers. (Bau et al., 2011).

S. venenatum Y.Z. Zhang, C.Y. Sun et Hai J. Li – new for Amur Oblast, for Sakhalin Oblast and for Khabarovsk Krai.

Specimens examined: *Amur Oblast*: Blagoveshchenskiy District, Mukhinsky Nature Park, 38 km north of Blagoveshchensk city, 50.68°N, 127.65°E, mixed forest, on soil, 11.08.2001, coll. NK, det. YuR (VLA M-18263); *Sakhalin Oblast*: Sakhalin Island, Yuzhno-Sakhalinsk city, Botanical Garden, 46.94°N, 142.76°E, on soil, 18.08.2016, coll. E. Bulakh, det. YuR (YuR 4020); Yuzhno-Kurilsky Urban Okrug, Kunashir Island, vicinity of Tretyakovo village, slope by the hot brook, 43.99°N, 145.64°E, on soil, 28.08.2016, coll. E. Bulakh, det. YuR (VLA M-25614); ibid., 28.08.2017, coll. E. Bulakh, det. YuR (YuR 4019); *Khabarovsk Krai*: Bolshekhekhtsirsky Nature Reserve, vicinity of Korfovskiy settlement, 48.23°N, 135.09°E, coniferous forest with *Abies* sp., *Picea* sp., on soil, 20.08.1985, coll. E. Bulakh, det. YuR (VLA M-21141).

Suillus punctipes (Peck) Singer – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: Bastak Nature Reserve, Dubovaya Sopka hill, 48.9665°N, 132.8823°E, mixed forest, on soil under *Pinus koraiensis*, 15.09.2022, EE (VLA M-27970).

Cantharellales

Clavulina ornatipes (Peck) Corner – new for Kamchatka Krai.

Specimens examined: *Kamchatka Krai*: Petropavlovskiy District, Khalakhtyrsky beech, 10 km east of Petropavlovsk city, 52.9997°N, 158.8610°E, meadow, on soil, 08.09.2015, AS (Shiryaev 1483-15).

Gomphales

Ceratellopsis acuminata (Fuckel) Corner – new for Primorskiy Krai.

Specimens examined: *Primorskiy Krai*: Ussury Nature Reserve, Suvorovskiy cordon, 43.6370°N, 132.5535°E, coniferous forest with *Abies* sp., *Quercus* sp., *Acer* sp., on fallen leaves, 30.07.18, AS [SVER(F) 90115].

C. equiseticola (Boud.) Corner – new for Kamchatka Krai.

Specimens examined: *Kamchatka Krai*: Kommandors Islands, Bering Island, Nikolskoye village, vicinities of airport, 55.1833°N, 166.0319°E, dead stems of *Equisetum* sp., 29.08.2015, AS (Shiryaev 1147-15).

Ramaria americana (Corner) R.H. Petersen – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Nevelskiy District, 25 km south of Shebunino village, 46.1974°N, 141.9363°E, coniferous *Abies*-dominated forest with *Quercus* sp., *Acer* sp., *Sasa* sp., on soil, 20.08.2008, AS [SVER(F)18458].

R. araiospora Marr et D.E. Stuntz – new for Jewish Autonomous Oblast and for Khabarovsk Krai.

Specimens examined: *Jewish Autonomous Oblast*: border of Birobidzhanskiy and Obluchenskiy Districts, 25 km west of Birobidzhan city, eastern slope of Schuki-Poktoi mountain, 48.8451°N, 132.6869°E, deciduous forest with single trees *Picea* sp., *Abies* sp., on soil, 16.09.2005, coll. G. Pichugina, det. AS [SVER(F) 48632].

Khabarovsk Krai: Vyazemskiy District, 10 km south-east of Vyazemskiy town, 47.4674°N, 134.8881°E, mixed forest with *Abies* sp., *Quercus* sp., *Acer* sp., on soil, 19.09.2002, coll. I. Lobanov, det. AS (Shiryaev 3117-02).

R. candida Corner – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: border of Birobidzhanskiy and Obluchenskiy Districts, 25 km west of Birobidzhan city, eastern slope of Schuki-Poktoi mountain, 48.8453°N, 132.6864°E, mixed forest with *Picea* sp., *Acer* sp., *Populus* sp., *Betula* spp., on soil, 15.09.2005, coll. G. Pichugina, det. AS [SVER(F)48624].

Hymenochaetales

Coltricia cinnamomea (Jacq.) Murrill J. Li – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Kunashir Island, vicinity of Tretyakovo village, 43.9938°N, 145.6611°E, *Abies-Picea* forest, on soil, 28.08.2016, coll. E. Bulakh, det. NB (VLA M- 25214).

Inocutis dryophila (Berk.) Fiasson et Niemelä – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: Birobidzhan city, bank of the Bira river, 48.7945°N, 132.8858°E, sparse deciduous forest, on damage to the trunk of a living *Ulmus* sp., 03.09.2021, coll. EE, det. NB (VLA M-28216); Bastak Nature Reserve, ecological trail, 49.0235°N, 133.02554°E, broad-leaved forest, on the trunk of living *Quercus mongolica*, 26.05.2022, NB (VLA M-27882).

Sanghuangporus baumii (Pilát) L.W. Zhou et Y.C. Dai – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Kunashir Island, Kurils Nature Reserve, 44.0326°N, 145.7741°E, mixed forest, on on wood of living *Euonimus* sp., 23.08.2017, coll. E. Bulakh, det. NB (VLA M- 27336).

Xylodon radula (Fr.) Ţura, Zmitr., Wasser et Spirin – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, bayou Sorokoverstnaya, 52.4921°N, 129.9630°E, floodplain forest, on dead branches of *Duschekia fruticosa*, 29.06.2022, NK (ABGI 1993/156110); ibid., vicinity of cordon Maltsevskiy, 52.4835°N, 130.0157°E, floodplain forest, on dry dead branches of *Duschekia fruticosa*, 29.06.2022, NK (ABGI 2101/156111).

Polyporales

Daedalea dickinsii Yasuda – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Kunashir Island, Kurils Nature Reserve, vicinities of Dubovoye village, 43.7963°N, 145.5042°E, predominantly *Quercus* sp. forest, on dead wood of *Quercus* sp., 23.08.2017, coll. E. Bulakh, det. NB (VLA M- 25258).

Daedaleopsis sinensis (Lloyd) Y.C. Dai – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Kunashir Island, Kurils Nature Reserve, 13 km from the Yuzhno-Kurilsk town, vicinities of Mendeleev Volcano, 44.0205°N, 145.7278°E, mixed forest, on dead wood of *Alnus* sp., 27.08.2017, coll. E. Bulakh, det. NB (VLA M- 25267).

Ischnoderma benzoinum (Wahlenb.) P. Karst. – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Kunashir Island, Kurils Nature Reserve, ecological trail "Stolbovskaya", 44.0085°N, 145.7021°E, *Abies-Picea* forest, on dead trunk of *Picea* sp., 01.09.2016, coll. E. Bulakh, det. NB (VLA M- 25193).

Jahnoporus brachiatus Spirin, Vlasák et Miettinen – new for Primorskiy Krai.

Specimens examined: *Primorskiy Krai*: Shkotovskiy District, vicinity of Anisimovka village, foothills of Mt. Falaza (Litovka), vic. Gribanovka hostel, 43.1166°N, 123.7833°E, broad-leaved forest, on the trunk of living *Betula* sp., 02.09.2021, coll. M. Dyakov, det. NP (LE F-347957, Strain LE-BIN 4914; ITS GenBank OQ428222; fig. 1e).

Panus conchatus (Bull.) Fr. – new for Magadan Oblast.

Specimens examined: *Magadan Oblast*: Olskiy District, Spafaryev Island, Bering Bay, 59.1520°N, 149.0086°E, abandoned village area, stack of timber imported from Primorye, on dead wood of *Betula* sp., 25.07.2013, NS (MAG 3903).

Gloeoporus pannocinctus (Romell) J. Erikss. – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, vicinity of cordon Meun, 52.9691°N, 130.1227°E, floodplain forest, on a dead trunk of *Salix* sp., 07.07.2020, NK (ABGI 2063/156115).

Gyrophanopsis polonensis (Bres.) Stalpers et P.K. Buchanan – new for Amur Oblast and for Khabarovsk Krai.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, bayou Sorokoverstnaya, 52.4928°N, 129.9639°E, floodplain forest, on a dead trunk of *Salix* sp., 29.06.2022, NK (ABGI 1992/156118); *Khabarovsk Krai*: Khabarovsk Urban Okrug, Khekhtsirskiy Reserve, valley of the Malye Chirki river, 48.2497°N, 135.0092°E, mixed forest, on dead wood of deciduous tree, 14.09.2018, NK (ABGI 2222/156109).

Mycoacia aurea (Fr.) J. Erikss. et Ryvarden – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, vicinity of cordon Meun, 52.9691°N, 130.1227°E, forest with dominance of *Populus* sp., *Picea* sp., on dead trunk of *Populus* sp., 08.07.2020, NK (ABGI 2015/156112).

Mycoaciella bispora (Stalpers) J. Erikss. et Ryvarden – new for the Russian Far East.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, vicinity of cordon Antonovskaya, 52.8362°N, 130.1155°E, mixed forest, on dead trunk of *Populus tremula*, 10.07.2020, NK (ABGI 2022/156113).

Phanerochaete affinis (Burt) Parmasto – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, left bank of the valley of the Burunda river, 52.5436°N, 130.0367°E, floodplain forest, on dead trunk of *Duschekia fruticosa*, 27.06.2022, NK (ABGI 2106/156116).

Russulales

Aleurodiscus disciformis (DC.) Pat. – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Shikotan Island, Tserkovnaya Bay, 43.7379°N, 146.682°E, mixed forest, on bark of living *Alnus* sp., 20.08.2019, coll. E. Bulakh, det. NB (VLA M-27339).

Lactarius zonarioides Kühner et Romagn. – new for Magadan Oblast.

Specimens examined: *Magadan Oblast*: Olskiy District, Zavyalov island, western part of the island, 59.0780°N, 150.5912°E, damp hummocky tundra with solifluction dips and with shrubs of *Betula exilis*, *Duschekia fruticosa*, *Pinus pumila*, *Salix sphenophylla*, on soil, 14.08.2019, NS (MAG 5268).

Peniophora incarnata (Pers.) P. Karst. – new for Sakhalin Oblast.

Specimens examined: *Sakhalin Oblast*: Kunashir Island, Kurils Nature Reserve, vicinities of Dubovoye village, 43.7963°N, 145.5042°E, predominantly *Quercus* sp. forest, on dead wood of *Alnus* sp., 28.08.2019, coll. E. Bulakh, det. NB (VLA M-27328).

Russula fellea (Fr.) Fr. – new for Jewish Autonomous Oblast.

Specimens examined: *Jewish Autonomous Oblast*: Smidovichskiy District, Cluster Zabelovsky of the Bastak Nature Reserve, lower part of Chertova river, 48.4225°N, 134.2325°E, *Quercus mongolica*-dominated forest, on soil, 08.08.2015, coll. EE, det. E. Bulakh (VLA M-25127).

R. pascua (F.H. Møller et Jul. Schäff.) Kühner – new for Russian Far East.

Specimens examined: *Magadan Oblast*: Olskiy District, Zavyalov Island, left bank of Rassvet Bay, 59.0803°N, 150.6202°E, shrub tundra with *Arctous alpina* and *Salix sphenophylla*, on soil, 22.08.2021, NS (MAG 5843; fig. 1f).

Thelephorales

Tomentella botryoides (Schwein.) Bourdot et Galzin – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Svobodnenskiy District, vicinity of Yukhta-3 village, 51.4865°N, 128.1969°E, *Quercus mongolica*-dominated forest with *Betula dauurica*, on burnt fallen trunk of *Quercus mongolica*, 03.08.2022, VK (TOB 1810767).

T. crinalis (Fr.) M.J. Larsen – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Selemdzhinskiy District, Nora Nature Reserve, vicinity of Meun point, 52.9691°N, 130.1228°E, *Picea*-dominated forest with an admixture of *Populus* sp., on dead wood, 08.07.2020, NK (ABGI 1496/156108).

T. punicea (Alb. et Schwein.) J. Schröt. – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Svobodnenskiy District, vicinity of Yukhta-3 village, 51.4865°N, 128.1969°E, *Quercus mongolica*-dominated forest with *Betula dauurica*, on dead fallen trunk of *Quercus mongolica*, 03.08.2022, VK (TOB 1810765).

Trechisporales

Subulicystidium perlongisporum Boidin et Gilles – new for Amur Oblast.

Specimens examined: *Amur Oblast*: Blagoveshchensk city, Komsomolskiy park, 50.2597°N, 127.4949°E, hardwood plantations, on a fallen branch of *Betula dauurica*, 27.08.2022, NK (ABGI 2218/156117).

Tremellales

Phaeotremella foliacea (Pers.) Wedin, J.C. Zamora et Millanes – new for Magadan Oblast.

Specimens examined: *Magadan Oblast*: Olskiy District, Spafaryev Island, Bering Bay, 59.1520°N, 149.0086°E, abandoned village area, stack of imported timber, in bark cracks on hardwood logs (*Betula* sp. and cf. *Chozenia arbutifolia*), in bark cracks, 23.07.2013, NS (MAG 5694).

DISCUSSION

A total of 77 species of macromycetes are reported as new for the administrative unites of the Russian Far East. 17 species belong to the *Ascomycota* (*Helotiales*, *Hypocreales*, and *Xylariales*), and 60 – to the *Basidiomycota* (*Agaricales*, *Auriculariales*, *Boletales*, *Cantharellales*, *Gomphales*, *Hymenochaetales*, *Polyporales*, *Russulales*, *Thelephorales*, *Trechisporales* and *Tremellales*). Twelve species (*Amanita olivaceogrisea*, *Arrhenia auriscalpium*, *A. obscurata*, *A. velutipes*, *Hyaloscypha herbarum*, *Hydropisphaera peziza*, *Hypomontagnella submonticulosa*, *Lachnum caricis*, *Mycoaciella bispora*, *Pholiota lundbergii*, *Russula pascua*, *Strobilurus stephanocystis* and *Tricholoma frondosae*) are reported for the first time for the Russian Far East. Four species (*Calycina subtilis*, *Cistella fugiens*, *Lachnum roridum* and *Lasiobelonium horridulum*) are a new species for Russia.

The distribution of new records of macromycetes within the regions is as follows:

15 – new for Amur Oblast;
12 – Jewish Autonomous Oblast;
4 – Kamchatka Krai;
28 – Khabarovsk Krai;
13 – Magadan Oblast;
4 – Primorskiy Krai;
11 – Sakhalin Oblast.

The studies on fungal diversity in the Far Eastern regions of Russia to be continued.

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Новые для регионов Российского Дальнего Востока виды макромицетов. 4

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Статья продолжает серию публикаций, посвященных находкам новых для Дальневосточного региона видов макромицетов. Приведены сведения о 77 видах базидиальных и сумчатых макромицетов, впервые отмеченных в семи административных единицах Дальнего Востока (Амурской, Еврейской автономной, Магаданской, Сахалинской областей, Камчатского, Приморского и Хабаровского краев). 13 видов отмечены впервые для Дальнего Востока России в целом. Четыре вида (*Calycina subtilis*, *Cistella fugiens*, *Lachnum roridum* и *Lasiobelonium horridulum*) являются новыми для России. Для некоторых редких видов даны примечания об основных отличиях в морфологии и экологии, об особенностях распространения. Цитируемый материал хранится в микологических коллекциях ABGI (Благовещенск), LE (Санкт-Петербург), MAG (Магадан), SVER (Екатеринбург), TOB (Тобольск), VLA (Владивосток) и в личных коллекциях Ю.А. Ребриева и А.Г. Ширяева.

Ключевые слова: аскомицеты, базидиомицеты, биоразнообразие, распространение грибов, редкие виды, Россия