

New data on ascomycetes of the Sakhalin Region (Russian Far East)

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Abstract. The article presents new data on ascomycetes (Pezizomycotina) of the Sakhalin Region, including addition-
al information on the species diversity of Sakhalin Island and the adjacent Moneron Island, as well as the islands of the
Greater Kuril Ridge (Antsiferov, Iturup, Matua islands) and the Lesser Kuril Ridge (Kunashir and Shikotan islands). An-
notated list includes 29 species with data on their habitats and substrates. Some species (*Botryosphaeria dothidea*, *Bulgaria*
inquinans, *Donadinia nigrella*, *Encoelia furfuracea*, *Galiella amurensis*, *Pachycudonia monticola*, *Perrotia gallica*, *Pseudoplec-*
tania melaena, *Sarea difformis*, *S. resinae*, *Verpa conica*) are published for the first time for the Sakhalin Region. Ascom-
es of *Cistella albidolutea* and *Parachnopeziza triseptata* found in Russia for the first time. Samples of fungi are stored in VLA.

Keywords: ascomycete fungi, biodiversity, mycobiota, Far East of Russia, Sakhalin Region, southern islands of the
Kuril Ridge.

Новые данные об аскомицетах Сахалинской области (Дальний Восток России)

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Резюме. В статье приведены данные о новых находках сумчатых грибов (Pezizomycotina) на территории Са-
халинской обл., в том числе дополнительные сведения о видовом разнообразии Сахалина и прилегающего к нему
о. Монерон, а также нескольких островов Большой Курильской гряды (острова Анциферова, Итуруп и Матуа) и
Малой Курильской гряды (острова Кунашир и Шикотан). Аннотированный список включает 29 видов с информа-
цией об их местообитаниях и субстратах. Ряд видов (*Botryosphaeria dothidea*, *Bulgaria inquinans*, *Donadinia nigrella*,
Encoelia furfuracea, *Galiella amurensis*, *Pachycudonia monticola*, *Perrotia gallica*, *Pseudoplectania melaena*, *Sarea difformis*,
S. resinae, *Verpa conica*) приводятся впервые для Сахалинской обл., а плодовые тела *Cistella albidolutea* и *Parachno-*
peziza triseptata отмечены впервые в России. Изученные образцы хранятся в Гербарии ФНЦ биоразнообразия ДВО
РАН (VLA).

Ключевые слова: аскомицеты, биоразнообразие, микобиота, Дальний Восток России, Сахалинская область,
южные острова Курильской гряды.

The diversity of the mycobiota of the Sakhalin Region was intensively studied at the end of the 20th century and the beginning of 21th century. For a number of reasons, both political and economic, the attention of researchers was attracted to the islands of the Lesser Kuril Ridge and Sakhalin Island. At the beginning of the 20th century, the ascomycetes diversity was actively studied by Jap-
anese scientists (Vouaux, 1913; Kawai, Otani, 1931; Imai, 1932; Nagai, Schimamura, 1933; Ishiyama, 1936). Since then and to this day, the study of the species diversity of fungi in the Sakha-
lin Region has attracted the attention of mycol-
ogists (Koval, 1960, 1964; Raitviir, 1963, 1971, 1985; Raitvir, Vasilyeva, 1972; Nelen, Ablakatova, 1974; Nizshie..., 1991; Bogacheva, 1996, 2005, 2012a; Vasilyeva, 1998; Flora..., 2004, 2005, 2006; Bogacheva, Raitviir, 2007; Egorova, 2015; Bo-
gacheva, Nikulin, 2024; etc.). This is perhaps one

of the most studied places in this regard in the tem-
perate latitudes of Eurasia (GBIF..., 2024). Pres-
ent study was focused on identification of kept in
VLA unidentified collections of ascomycete fungi.

Materials and Methods

The material used in the work was collected by the author on Kunashir Island in 1987 and on Sakhalin Island in 2008. Were also studies the samples collected by E. M. Bulakh on the is-
lands of Iturup, Kunashir, Sakhalin and Shikotan, by employees of the Kurilsky State Nature Re-
serve E. V. Linnik in 2018 and A. N. Tikhonov in 2020 on Kunashir Island, and some colleagues (V. Yu. Barkalov, V. V. Bogatov, and E. Yu. Saenko) on the islands of Antsiferova, Matua, and Moneron. A total of 84 samples were studied.

The laboratory processing of the collected ma-
terial was carried out according to the methods
generally accepted in mycology (Hawksworth,

1974; Baral, 1987a, b, 1992) on the basis of the Laboratory of Botany of the Federal Scientific Center of the East Asia Terrestrial Biodiversity of the Far East Branch of the Russian Academy of Sciences. To examine ascospores, asci, paraphyses and other microstructures of dried specimens they were rehydrated on slide and gently squashed by cover glass, using water as the mounting fluid. The work used morphological descriptions of fruiting bodies made by collectors. Micromorphological description of the samples was carried out in laboratory conditions using a Nikon Eclips 200 (1500×) and MBS 10 (100×) microscopes. Measurements of important morphological characters such as length and width were made from 20–50 observations, and variability calculated using standard deviation (with absolute minima and maxima in brackets) and average $\pm$ standard deviation values.

The taxon names are actualized in accordance with the Index Fungorum database (2024). As an important source of information about species occurrences Global Biodiversity Information Facility (GBIF..., 2024) was used. For a species new to the mycobiota of Russia, morphological descriptions of the studied samples are provided.

Results and Discussion

As a result, new data on the species composition of ascomycete fungi (Pezizomycotina) of the Sakhalin Region was expanded. We have added 15 species to the list of species of ascomycetes of the Sakhalin Region. Of these, ascoms of two species (*Cistella albidolutea* and *Parachnopeziza tri-septata*) are listed here for the first time for Russia. The specimen of *Pyrenopeziza chailletii* is found for the first time in the Russian Far East.

Annotated list includes 29 species with data on their habitats and substrates. The species in the list are arranged in alphabetical order. The following symbols are used in the species list below: * — new to the Sakhalin Region, ** — new to the Russian Far East, *** — new to Russia.

***Botryosphaeria dothidea** (Moug.) Ces. et De Not. — Kunashir Island, vicinity of the Dubovoe village, 43.76666°N, 145.49742°E, on twigs of *Alnus* sp., 30 VII 1987, Bogacheva, VLA D-4489.

Previously, the species was recorded on the territory of the Bolshekhehtsirsky State Nature Reserve in southern part of the Khabarovsk Territory on *Sorbaria sorbifolia* (L.) A. Br. (Vasilyeva, 1998) and in the vicinity of Vladivostok in the Primorye Territory on *Phellodendron amurense* Rupr. (Vasilyeva, 1998).

Brunnipila palearum (Desm.) Baral — Kunashir Island, 44.08333°N, 145.98333°E, on herbaceous plants stems, 16 V 2020, A. N. Tykhonov (A. H. Тухонов), VLA D-4627.

***Bulgaria inquinans** (Pers.) Fr. — Iturup Island, 45.02000°N, 147.37000°E, on *Quercus* sp. wood, 27 VII 2018, E. M. Bulakh (E. M. Булах), VLA D-4454.

It is widespread species in the oak habitat. On the territory of the Russian Far East it is found in the Jewish Autonomous Region (Bogacheva, 2007a), in the central part of the Khabarovsk Territory (Bogacheva et al., 2015), the Amur Region (Bogacheva et al., 2018), in the central and southern parts of the Primorye Territory (Koval, 1972; Plants..., 2016).

Chlorenchelia versiformis (Pers.) J. R. Dixon — Kunashir Island, vicinity of the Alyokhino village, 43.91830°N, 145.52840°E, coastal broad-leaved forest, on dead wood of *Quercus* sp., 6 VIII 1987, Bogacheva, VLA D-3321; Kuril Nature Reserve, Stolbovskaya trail, 44.05000°N, 145.59000°E, on dead wood, 1 IX 2016, E. M. Bulakh, VLA D-4018.

The species is widespread in the deciduous forests of the Primorye Territory, the central and southern parts of the Khabarovsk Territory, in the Amur Region and Jewish Autonomous Region (Bogacheva, 2007a; Bogacheva et al., 2018). In the Sakhalin Region, we previously noted it on the islands of Sakhalin and Kunashir (Bogacheva, 2012a).

*****Cistella albidolutea** (Feltgen) Baral — Kunashir Island, vicinity of the Alyokhino village, 43.91830°N, 145.52840°E, coastal broad-leaved forest, on dead stems of cereals, 7 VIII 1987, Bogacheva, VLA D-4449.

The species was described on dead leaves of Cyperaceae and Poaceae (Feltgen, 1901). Ascoma in the form of a cup-shaped apothecium, whitish, 0.2–1 mm in diam., sessile. The hymenium whitish. Hairs clavate, hyaline, thin-walled, 33–35 × 3–4 µm, apically verrucose, smooth below, apically expanded up to 10 µm. Asci cylindrical, amyloid, 50–60 × 7–9 µm. Spores fusiform, slightly curved, 2–3-septate, 4.5–17.5 × 2.5–3 µm. Paraphyses lanceolate, not expanded at the apex.

Claviceps purpurea (Fr.) Tul. — Antsiferova Island, 50.12000°N, 154.59000°E, on dead cereal stems, 15 VIII 1997, V. V. Bogatov (B. B. Богатов), E. M. Saenko (E. M. Саенко), VLA D-4434.

The species is widespread in temperate latitudes. Previously, in the Russian Far East, the species was found only in the coniferous forests of the Khabarovsk Territory and Amur Region (Nizshie..., 1991). On the territory of the Sakhalin Region, the species was previously recorded on the islands of Ushishir [1 VIII 1997, V. V. Bogatov, VLA P-0442; 24 VIII 1978, A. Zavorotnyi (A. Заворотный), VLA P-8056] and Iturup (Koval, 1960).

***Donadinia nigrella** (Seaver) M. Carbone et al. — Kunashir Island, 44.05000°N, 145.59000°E, on dead wood, 2 V 2020, A. N. Tykhonov, VLA D-4618.

The main range of the species is located on the Pacific coast of North America; it was also recorded in Japan (GBIF..., 2024). Previously, in the Russian Far East, the species was found only in the coniferous forests of the Khabarovsk Territory (Bogacheva, Bukharova, 2020).

Discocainia treleasei (Sacc.) J. Reid et A. Funk — Kunashir Island, 44.05000°N, 145.59000°E, on bark of *Abies* sp., 16 V 2020, A. N. Tykhonov, VLA D-4617.

Previously, the species was noted on the Sakhalin Island (Bogacheva, 2012a), in the central part of the

Khabarovsk Territory (Bogacheva *et al.*, 2015), and in the central part of Kamchatka (Rebriev *et al.*, 2024).

***Encoelia furfuracea** (Roth) P. Karst. — Matua Island, Dvoynnaya Bay, 48.44800°N, 153.13180°E, thickets of sweet grass and alder, on *Filipendula* sp., 3 VIII 1999, V. Yu. Barkalov (B. Ю. Баркалов), VLA D-4013.

In the Russian Far East, the species is not common, but has been recorded throughout most of the region: the Khabarovsk (Bogacheva, 2021a; Verkhnebureinsky District, Bureika River valley, 52.18791°N, 134.53473°E, 2 VI 2009, E. A. Erofeeva (E. A. Ерофеева), VLA D-3583), and Primorye (Shkotovsky District, Anikina Pad', 30 IX 1945, L. N. Vasilyeva, VLA D-102; vicinities of Vladivostok, 10 V 1959, L. N. Vasilyeva, VLA D-103) territories.

***Galiella amurensis** (Lj. N. Vassiljeva) Raitv. — Kunashir Island, 17 km highways Yuzhno-Kurilsk — Mendeleevo, Stolbovskaya ecological trail along the stream, 44.05000°N, 145.59000°E, on dead wood of *Abies* sp., 19 VIII 2017, E. M. Bulakh, VLA D-4124.

This phytopathogenic fungus was found on conifers in the Khabarovsk and Primorye territories (Azbukina *et al.*, 2006; Fungi..., 2011).

Helvella crispa (Scop.) Fr. — Kunashir Island, Tretyakovo village, 43.98911°N, 145.64199°E, side of the road, on soil, 2 VIII 2018, E. V. Linnik (E. B. Линник), VLA D-4293; *ibid.*, 27 VIII 2019, E. M. Bulakh, VLA D-4292.

Widespread species in temperate latitudes. Previously, in the Sakhalin Region the species was collected on Sakhalin Island (Flora..., 2004).

Humaria hemisphaerica (F. H. Wigg.) Fuckel — Kunashir Island, Tretyakovo village, 43.98910°N, 145.64190°E, on soil, 10 VIII 1987, Bogacheva, VLA D-4447; Kuril Nature Reserve, Stolbovskaya trail, 44.05000°N, 145.59000°E, on soil, 1 IX 2016, E. M. Bulakh, VLA D-4023.

The species is widespread in temperate latitudes. In the Russian Far East, it was found in broad-leaved and coniferous-deciduous forests of the Kamchatka, Khabarovsk and Primorye territories, Amur Region and Jewish Autonomous Region (Bogacheva, 2001, 2007b, 2012a, b, 2021a, b; Bogacheva *et al.*, 2018). In the Sakhalin Region, it was previously recorded only on Sakhalin and Moneron islands (Raitviir, Bogacheva, 2006; Bogacheva, 2012a).

Hymenoscyphus imberbis (Bull.) Dennis — Iturup Island, 45.02000°N, 147.37000°E, on dead wood of *Alnus* sp., 6 X 1956, E. Z. Koval (Э. З. Коваль), VLA D-564; *ibid.*, on dead wood of *Quercus* sp., 4 VIII 2018, E. M. Bulakh, VLA D-4460.

In the Russian Far East, the species was found in the Khabarovsk and Primorye territories, the Jewish Autonomous Region and Sakhalin Region (Azbukina *et al.*, 2006; Bogacheva, 2007b, 2012a, 2021a; Bogacheva *et al.*, 2018). In the Sakhalin Region it was previously known on the islands of Kunashir (Bogacheva, 2012a) and Moneron (Raitviir, Bogacheva, 2006).

Lachnellula resinaria (Cooke et W. Phillips) Rehm — Kunashir Island, 44.05000°N, 145.59000°E, on bark of *Abies* sp., 13 V 2020, A. N. Tykhonov, VLA D-4624.

It was noted for the first time in the mycobiota of the Kuril State Nature Reserve. Previously, the species was recorded on Sakhalin Island (Bogacheva, 2012a).

Legaliana badia (Pers.) Van Vooren — Shikotan Island, pass to Dmitrov Bay, sea coast, 43.47560°N, 146.43170°E, on soil, 1 IX 2019, E. M. Bulakh, VLA D-4428.

The species is widespread in the Russian Far East. It has been recorded on the islands of the Sakhalin Region since 1960 (Bogacheva, 2012a).

Mollisia hydrophila (P. Karst.) Sacc. — Kunashir Island, vicinity of the Alyokhino village, coastal broad-leaved forest, 43.91830°N, 145.52840°E, on dead stems of cereals, 7 VIII 1987, Bogacheva, VLA D-4448.

Previously, the species was recorded in the Khabarovsk (Bogacheva, 2007b) and Primorye (Bogacheva, 2001) territories, the Chukotka Autonomous Area (Western Chukotka, Chaunsky District, upper reaches of the Kitepveem River, 21 VII 1979, L. N. Vasilyeva, VLA D-3614), and in the Sakhalin Region on the islands of Sakhalin and Moneron (Bogacheva, 2002; Flora..., 2006). Indicated for the first time for the Kuril State Nature Reserve.

***Pachycudonia monticola** (Mains) S. Imai — Kunashir Island, 44.05000°N, 145.59000°E, on wood of *Abies* sp., 9 VII 2020, A. N. Tykhonov, VLA D-4470.

In Russia, the species was recorded only in the Far East in the Nanaisky District of the Khabarovsk Territory (Anyui National Park, middle reaches of the Anyui River, 49.22359°N, 137.42497°E, 21 VIII 2010, E. A. Erofeeva, VLA D-3601), the Ussuriysky District of the Primorye Territory (Azbukina *et al.*, 2006) and the vicinity of Vladivostok [11 IX 1961, M. M. Nazarova (M. M. Назарова), VLA D-203].

*****Parachnopeziza triseptata** (Raschle) Korf et W. Y. Zhuang — Sakhalin Island, Dolinsky District, outskirts of the Firsovo village, 47.65350°N, 142.57010°E, on dry fern fronds, 13 VII 2008, Bogacheva, VLA D-4632.

The species was described on *Athyrium alpestre* (Hoppe) F. Nyl. (Raschle, 1979) and until now has been observed only in Switzerland (GBIF..., 2024). Ascoma in the form of a cup-shaped apothecium, yellowish, 0.5–1 mm in diam., on a small stalk 0.3–0.4 mm high. At the base of the stalk there are sparse colorless hyphae (subiculum). The excipule is angular. Hairs hyaline, sinuous, smooth, thin-walled, rounded at the apex, not expanded, 63–65 × 3–4 µm. Asci cylindrical, amyloid, 65–70 × 9–12 µm. Spores fusiform, elongated, with 3 partitions, 20–23.3 × 3.5–3.8 µm. Paraphyses cylindrical, slightly expanded at the apex.

***Perrotia gallica** (P. Karst. et Har.) Spooner — Iturup Island, 45.02000°N, 147.37000°E, on wood of *Abies* sp., 1 IX 2020, E. M. Bulakh, VLA D-4455.

The species was previously recorded in Siberia (Bogacheva, Morozova, 2002) and the Khabarovsk Territory (Bogacheva, 2021a).

Peziza micropus Pers. — Iturup Island, 45.02000°N, 147.37000°E, on wood of *Quercus* sp., 30 VIII 2018, E. M. Bulakh, VLA D-4458.

In the Russian Far East, the species was found in the Nanaisky (Anyui National Park, middle reaches

of the Anyui River, 49.22359°-N, 137.42497°-E, 5 VI 2013, *E. A. Erofeeva*, VLA D-2944), and Vaninsky (Bogacheva *et al.*, 2015) districts of the Khabarovsk Territory, in the vicinity of Khabarovsk (Bogacheva, 2021b), in the Jewish Autonomous Region (Bastak Nature Reserve, Dubovaya Sopka, 48.56370°-N, 133.07130°-E, 19 VIII 2004, *Bogacheva*, VLA D-2568). In the Sakhalin Region it was first recorded in 1960 on Sakhalin Island (Bogacheva, 2012a).

***Pseudoplectania melaena** (Fr.) Sacc. — Kunashir Island, 44.05000°N, 145.59000°E, on dead wood of *Abies* sp., 19 IV 2020, *A. N. Tykhonov*, VLA D-4615.

Previously, in the Russian Far East, the species was found only in the coniferous forests of the Khabarovsk Territory (Bogacheva *et al.*, 2015).

Pyrenopeziza benesuada (Tul.) Gremmen — Kunashir Island, riverine forest, 44.05000°N, 145.59000°E, deadwood of *Alnus* sp., 30 V 2020, *A. N. Tykhonov*, VLA D-4500.

The species is widely found in the Russian Far East, including the Sakhalin Region (Bogacheva, 2012a). However, on Kunashir Island it found for the first time.

****P. chailletii** (Pers.) Fuckel — Sakhalin Island, Tymovsky District, vicinity of the Zonalnoye village, floodplain of the Tym River, 50.39260°N, 142.45380°E, on dead stems of *Senecio cannabifolius* Less., 22 IX 2008, *Bogacheva*, VLA D-4634.

In Russia, it was previously recorded in the Murmansk Region (Kari, 1936).

Rutstroemia chamaemori L. Holm et K. Holm — Moneron Island, Mt. Staritsky, 46.14000°N, 141.13000°E, stone-birch forest, on litter, 5 VII 2004, *V. Yu. Barkalov*, VLA D-4353.

In the Russian Far East, it was collected by the author in the alder forest of the Podkova crater on the Klyuchevskaya Sopka volcano in the Kamchatka Territory (Bogacheva, 2012b) and on hazel branches in the floodplain forest of the Naiba River valley on Sakhalin Island (Bogacheva, 2012a).

***Sarea difformis** (Fr.) Fr. — Kunashir Island, 44.05000°N, 145.59000°E, on bark of *Abies* sp., 16 V 2020, *A. N. Tykhonov*, VLA D-4616, VLA D-4499.

The species is widespread in temperate latitudes. In the Russian Far East, it was found in coniferous-deciduous forest of the Kamchatka Territory (Himelbrant *et al.*, 2019).

***S. resinae** (Fr.) Kuntze — Sakhalin Island, Dolinsky District, vicinity of the Firsovo village, 47.39020°N, 142.34070°E, on bark of *Abies* sp., 13 VII 2008, *Bogacheva*, VLA D-4501.

The species is widespread in temperate latitudes. In the Russian Far East, it was found in coniferous-deciduous forest of the Primorye Territory (GBIF..., 2024).

****Schizothyrioma ptarmicae** (Desm.) Höhn. — Kunashir Island, 44.05000°N, 145.59000°E, on stems of *Achillea ptarmica* L., 15 IV 1956, *E. Z. Koval*, VLA D-4495.

The species was recorded for the first time in the Russian Far East. Previously, its noted in the Krasnoyarsk Territory (Thümen, 1880). A highly

specialized pathogenic fungus on *Achillea ptarmica* (Brand, 2018).

Scutellinia setosa (Nees) Kuntze — Iturup Island, 45.02000°N, 147.37000°E, on dead wood, 27 VII 2018, *E. M. Bulakh*, VLA D-4452.

In the Sakhalin Region, it was previously recorded only on Kunashir Island (Bogacheva, 2012a).

***Verpa conica** (O. F. Müll.) Sw. — Kunashir Island, sea coast, 44.05000°N, 145.59000°E, under the canopy of bamboo, on soil, 6 VI 2020, *A. N. Tykhonov*, VLA D-4496.

On the territory of the Russian Far East, it was found in the Jewish Autonomous Region (Obluchensky District, floodplain of the Bira River, 17 V 2012, *E. A. Erofeeva*, VLA D-3644) and the Primorye Territory (Azbukina *et al.*, 2006).

A review of the literature and the results of our revision of herbarium material from VLA show that the biota of ascomycete fungi (Pezizomycotina) of the Sakhalin Region includes 522 species: Geoglossomycetes — 3 species, Dothideomycetes — 5, Leotiomyces — 218, Orbiliomyces — 75, Pezizomycetes — 89, Sareomycetes — 2, Sordariomycetes — 130 species. To date, the islands of Sakhalin and Kunashir have been the most extensively studied in terms of ascomycete fungi, with the mycobiota of the former island comprising 301 species, and the latter, 192 species. The mycobiota of Sakhalin Island, in our opinion, has been studied most fully and can serve as reliable reflection of the main ascomycetous species diversity within the Sakhalin Region. The fungal diversity of the other smaller islands has been the subject of only limited research. A total of 52 species have been recorded on Moneron Island, 35 species — in the plant communities of Iturup Island, and five species — on Shikotan Island. In the other islands of the Sakhalin Region, only some finds of ascomycetous fungi are known. This fact does not reflect either the unique characteristics or the diversity of these territories (Antsiferova — 3 species, Matua — 3 species).

It should be noted that different groups of ascomycetes have been studied unevenly on the islands. Thus, 100 species of Dothideomycetes have been recorded on Kunashir Island (Vasilyeva, 1998). On Sakhalin Island, 18 species of this fungi group have been found (Flora..., 2004), and seven on Iturup Island (Vasilyeva, 1998). There are no data on the species diversity of this group on other islands of the Sakhalin Region. The most fully studied species of Leotiomyces and Pezizomycetes diversity is in the Sakhalin Region (Koval, 1964; Nelen, Ablakatova, 1974; Nizshie..., 1991; Bogacheva, 2002, 2005, 2012a; Bogacheva, Raitviir, 2007; Bogacheva, Nikulin, 2024).

The species diversity of ascomycetous fungi in the territories adjacent to the Sakhalin Region is also a subject of active study (Hino, Katumoto, 1961; Imazeki *et al.*, 1988; Nizshie..., 1991; Vasilyeva, 1998; Hosoya, Otani, 1997; Hosoya, 2004, 2005, 2009; Plants..., 2016; Itagaki *et al.*, 2019; Tochihara, Hosoya, 2019; *etc.*). However, due to the uneven study of different groups of ascomycete fungi we consider it premature to compare the species composition of mycobiota in the Sakhalin Region and adjacent territories.

Acknowledgments

The research was carried out within the state assignment of Ministry of Science and Higher Education of the Russian Federation (№ 124012400285-7).

Conflicts of Interests. The author have declared no conflicts of interest.

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