



# An annotated list of lichens currently known on Matua Island (Middle Kurils, Russian Far East)

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## ABSTRACT

The presented work is based on the study of material collected by F.A. Romanyuk on Matua Island, Middle Kurils, in 2017, and on literature data. Currently, 70 lichen species are registered for the island; among them 24 are known only from literature data and 66 were collected during our study including 46 species registered for Matua for the first time. *Verrucaria fusconigrescens* is the first record for the Russian Far East. *Lecanora atrosulphurea*, *L. sulphurea*, *Lecidella asema*, *Lendemerella kamozatica* and *Lepra panyrga* are new to Kurils and the Sakhalin Region. Information about location and substrate is provided for each species. For the species new to the Sakhalin Region, brief information on ecology and distribution, as well as images are provided.

**Keywords:** coastal habitat, lichen diversity, Northeast Asia, Sarychev Peak volcano

## РЕЗЮМЕ

**ЕЖКИН А.К., РОМАНОК Ф.А., ФРОЛОВ И.В., ЯКОВЧЕНКО Л.С. АННОТИРОВАННЫЙ СПИСОК ЛИШАЙНИКОВ, ИЗВЕСТНЫХ НА ОСТРОВЕ МАТУА (СРЕДНИЕ КУРИЛЫ, ДАЛЬНИЙ ВОСТОК РОССИИ).** Работа основана на исследовании коллекции лишайников, собранной Ф.А. Романюком в 2017 г. на о. Матуа, Средние Курилы. Всего, включая литературные данные, для острова указывается 70 видов, из которых 24 вида были отмечены ранее; 66 видов было собрано во время экспедиции, включая 46 видов, впервые отмеченных для острова. *Verrucaria fusconigrescens* впервые указывается для Российского Дальнего Востока. *Lecanora atrosulphurea*, *L. sulphurea*, *Lecidella asema*, *Lendemerella kamozatica* и *Lepra panyrga* – новые для Курильских островов и Сахалинской области. Для каждого вида представлена информация о месте сбора и субстрате. Для видов, впервые найденных на территории Сахалинской области, представлена краткая информация по экологии и распространению, а также их фотографии.

**Ключевые слова:** разнообразие лишайников, вулкан Пик Сарычева, прибрежная среда обитания, Северо-Восточная Азия

Matua (48°05'N 153°13'E) is a small (50 km<sup>2</sup>) remote volcanic island in the Pacific Ocean belonging to the Middle Kuril Islands. Sarychev Peak (1446 m), an active volcano on the island, is mainly explosive and explosive-effusive by its nature of the activity. The products of the Sarychev Peak's eruptions are dominated by pyroclastics (Degterev et al. 2011). The climate of the island is cold and similar to the northern Kuril Islands with a high precipitation of 1223 mm/year, a predominance of cloud cover, frequent fogs (up to 205 days per year), constant and strong winds (Anonymous 1990). Winter is relatively mild (the average monthly temperature of January is -6°C), and summer is cold – the average temperature of the warmest month (August) is +10.9°C. Vegetation is boreal-alpine typical for Middle Kurils (Grishin & Terekhina 2012). Lichen flora of the island was poorly investigated. Earlier only 24 lichen species were reported for Matua Island from several publications (Jensen et al. 2004, Sanamyan & Sanamyan 2020, Ezhkin et al. 2023, Ezhkin & Kaganov 2025). The current work is the third annotated list of lichens for the Middle Kurils. Earlier, 46 species were explored for Simushir (Zueva et al. 2025) and 31 species for Broutona Island (Zueva et al. 2024).

This paper presents lichen material collected by the second author Fedor A. Romanyuk in the summer period of 2017 in the southeastern more or less flat part of Matua Island, which is periodically exposed to aerial pyroclastics and the weak effect of vapor-gas emissions of the active volcano Sarychev Peak (Fig. 1). The specimens of lichens were examined using a stereomicroscope (MBS-10) and compound microscope (LOMO Mikmed 3) by standard microscopic techniques (Stepanchikova & Gagarina 2014). Anatomical examination was undertaken using hand cut sections mounted in water with following reagents: 10 % KOH (K) and Lugol's solution (I). Spot tests were made with K, sodium hypochlorite solution (C) and 1,4-p-phenyldiamine (P), and I. Examined specimens are deposited in the herbaria of the Institute of Marine Geology and Geophysics (SAK).

Totally, 70 lichen species are registered for Matua Island including 24 species known from literature data. Sixty-six lichen species were collected during our study including 46 species new for Matua Island. Among them 6 species are new to Kurils and the Sakhalin Region, including 1 species new for the Russian Far East. The species reported for the first time for Kurils and the Sakhalin Region are marked with “!”, new

species for the Russian Far East is marked with “!!” and new for Matua Island are marked with “\*”. The annotated lichen species list contains the locality, substrate and the herbarium number.

### Collecting locations

Mat 006 – vicinity of Sarychev Peak Volcano, thickets of *Duschekia fruticosa* (Rupr.) Pouzar, 48°05'57.50"N 153°13'28.86"E, 344 m, 11 June 2017.

Mat 007 – vicinity of Mt. Kruglaya, thickets of *Duschekia fruticosa*, 48°04'07.76"N 153°15'18.32"E, 68 m, 12 June 2017.

Mat 008 – Dvoynaya Bay, thickets of *Duschekia fruticosa*, 48°04'14.29"N 153°15'52.32"E, 37 m, 12 June 2017.

Mat 009 – central valley part, thickets of *Duschekia fruticosa*, 48°03'15.25"N 153°15'11.52"E, 66 m, 12 June 2017.

Mat 011 – Dvoynaya Bay, sparse vegetation of steep and sheer slopes, 48°04'39.07"N, 153°15'45.64"E, 20 m, 16 June 2017.

Mat 012 – Pologiy Cape, boulder coast, 48°02'27.61"N 153°13'41.28"E, 2 m, 14 June 2017.

Mat 081 – Yurlova Cape, treeless terrace, 48°02'36.70"N, 153°16'05.19"E, 38 m, 27 June 2017.

Mat 082 – Ibid., treeless terrace, 48°02'24.66"N, 153°16'38.59"E, 20 m, 27 June 2017.

Mat 311 – North of Klyuv Cape, mountain heather, 48°05'38.02"N 153°14'51.65"E, 25 m, 11 June 2017.

Top 001 – Toporkovy Island, boulder coast, 48°04'27.42"N 153°16'54.16"E, 2 m, 13 June 2017.

### Annotated lichen species list

\**Aspicilia cinerea* (L.) Körb. – Mat 011, on rock, 369.

*Buellia badia* (Fr.) A. Massal. – Mat 011, Mat 012, on rock, 3651, 3653, 3658, 3665, 3666, 3667. The species was previously reported for Matua (Ezhkin et al. 2023).

*Buellia disciformis* (Fr.) Mudd. – Mat 006, on bark of *Duschekia fruticosa*, deadwood, 3696. The species was previously reported for Matua (Ezhkin et al. 2023).

\**Caloplaca caesiorufella* (Nyl.) Zahlbr. – Mat 012, Mat 081, on soil, dead wood, 2083, 2098.

\**Caloplaca stillicidiorum* (Vahl) Lynge – Mat 081, on soil, 2074, 2099, 3663.

\**Candelariella vitellina* (Hoffm.) Müll. Arg. – Mat 011, on rock, 2088, 2090.

*Cetraria laevigata* Rass. – Mat 081, on soil, 3156, 92, 3642. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).

\**Cetraria sepincola* (Ehrh.) Ach. – Mat 009, on bark of *Duschekia fruticosa*, 3671.

*Cladonia arbuscula* (Wallr.) Flot. – Mat 081, on soil, 99. The species was previously reported for Matua (Ezhkin & Kaganov 2025).

\**Cladonia coccifera* (L.) Willd. – Mat 081, on soil, 3643, 3686, 3692, 3693.

\**Cladonia coniocraea* (Flörke) Spreng. – Mat 009, on bark of *Duschekia fruticosa*, 3691.

\**Cladonia cornuta* (L.) Baumg. – Mat 081, on soil, 3689.

\**Cladonia deformis* (L.) Hoffm. – Mat 012, Mat 311, on rock, 3656, 3690.

\**Cladonia fimbriata* (L.) Fr. – Mat 007, Mat 011, on bark of *Duschekia fruticosa*, on rock, 3652, 3657.

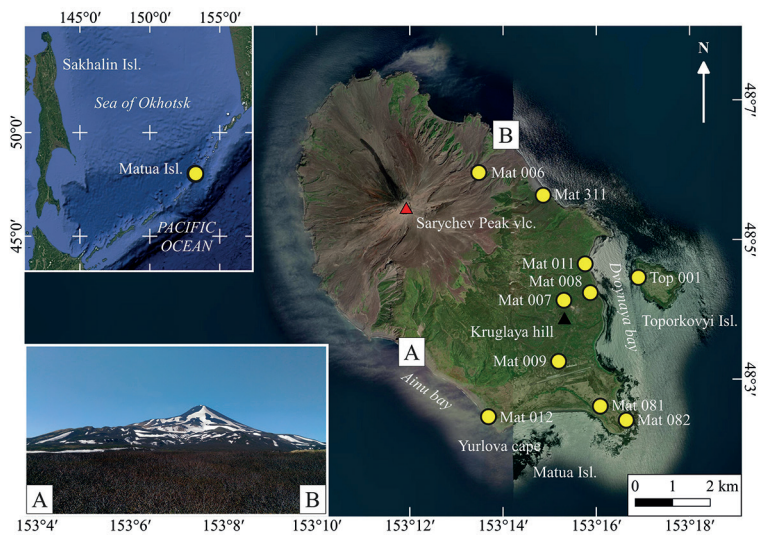


Figure 1 Map of the study area with collecting locations on Matua Island

\**Cladonia grisea* (Ahti) J.C. Wei – Mat 081, on soil, 3684.

\**Cladonia metacorallifera* Asahina – Mat 081, on soil, 3676.

*Cladonia mitis* Sandst. – Mat 081, on soil, 3682, 3687, 3688. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).

\**Cladonia pleurota* (Flörke) Schaer. – Mat 081, on soil, 3681.

*Cladonia subulata* (L.) F.H. Wigg. (Sanamyan & Sanamyan 2020).

\**Cliostomum griffithii* (Sm.) Coppins – Mat 006, on bark of *Duschekia fruticosa*, 3639.

\**Hypogymnia physodes* (L.) Nyl. – Mat 081, on soil, 3166, 3644.

!*Lecanora atosulphurea* (Wahlenb.) Ach. – Mat 011, on rock, 3631, 3635, 3636, 3653, 3668, 3694 (Fig. 2A). The species occurs on exposed montane siliceous rocks, circumpolar in the Northern Hemisphere, mostly in Arctic regions, distributed in Europe, Macaronesia, North America, Asia and Africa (Makarevich 1971; Smith et al. 2009). In the Russian Far East, the species is known from Chukotka Autonomous Area, Republic of Sakha (Andreev et al. 1996) and the Kamchatka Territory (Himmelbrant et al. 2021).

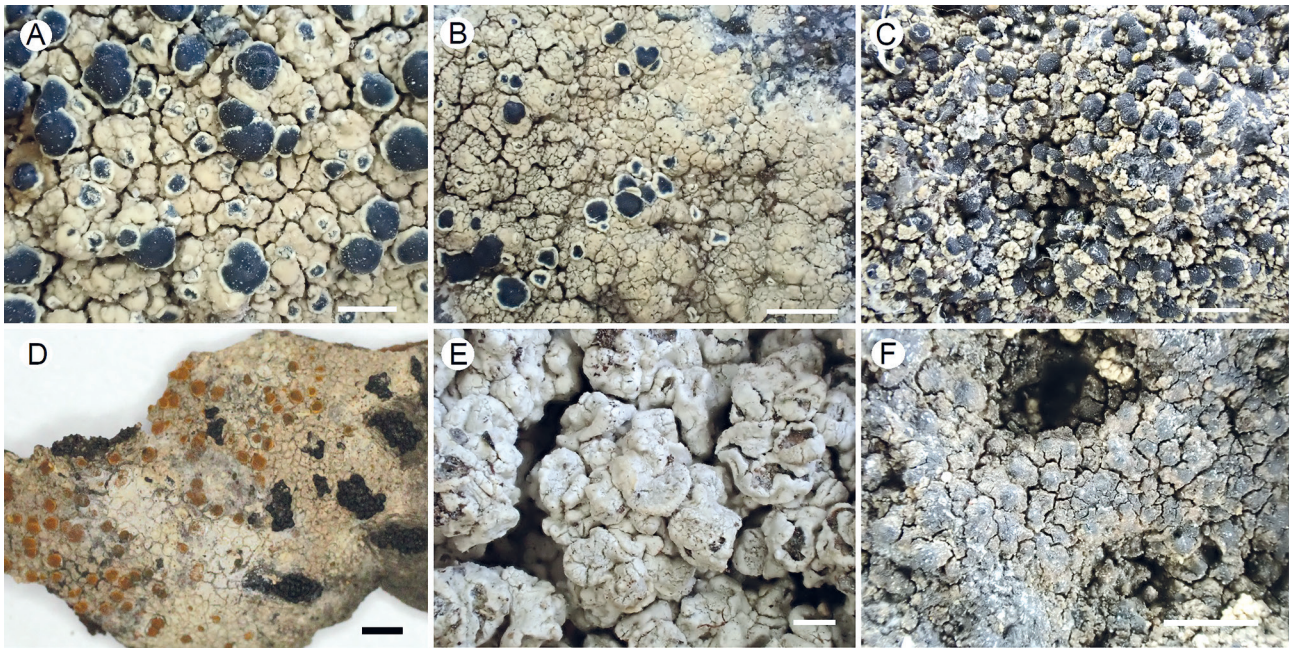
\**Lecanora chlarotera* Nyl. – Mat 006, Mat 008, Mat 007, on bark of *Duschekia fruticosa*, 3161, 3163, 3165, 3654, 3697, 3165, 3178, 3269, 3270, 3271, 3272, 3273, 3274, 3278, 3280, 3637, 3639, 3654, 3655, 3673, 3696.

\**Lecanora intricata* (Ach.) Ach. – Mat 011, Mat 012, on rock, 3634, 3658, 3659.

*Lecanora perspersa* Nyl. – on rock (Sanamyan & Sanamyan 2020).

\**Lecanora polytropa* (Hoffm.) Rabenh. – Mat 011, Mat 012, on rock, 2112, 2088, 2087, 3626, 3649, 3651, 3653, 3665, 3667, 3694, 3698.

!*Lecanora sulphurea* (Hoffm.) Ach. – Mat 011, on rock, 3698, 3633, 3699, 3700 (Fig. 2B). The species occurs on exposed, often nutrient-rich, siliceous rocks and walls, especially in the xeric-supralittoral zones on the coast, circumboreal in the Northern Hemisphere, known from Europe, Macaronesia, Asia, Africa, North and South America (Smith et al. 2009). In the Russian Far East, the species is known from the Kamchatka Territory (Himmelbrant et al. 2021), Chukotka Autonomous Area (Chesnokov et al. 2025) and Khabarovsk Territory (Yakovchenko et al. 2013).



**Figure 2** New species for the Sakhalin Region: A – *Lecanora atosulphurea* (Wahlenb.) Ach., B – *L. sulphurea* (Hoffm.) Ach., C – *Lecidella asema* (Nyl.) Knoph & Hertel, D – *Lendemeriella kamczatica* (Savicz) I. V. Frolov, E – *Lepra panyrga* (Ach.) Hafellner, F – *Verrucaria fusconigrescens* Nyl. Scale bar: A, C, E, F – 1 mm, B, D – 2 mm

*Lecanora symmicta* (Ach.) Ach. – Mat 008, Mat 006, Mat 007, Mat 009, on bark of *Duschekia fruticosa*, 2115, 3161, 3270, 3271, 3637, 3648, 3683, 3696. The species was previously reported for Matua (Sanamyan, Sanamyan 2020).

\**Lecidea atrobrunnea* (DC.) Schaer. – Mat 012, on rock, 3650, 3695.

*Lecidea auriculata* Th. Fr. – on rock (Sanamyan & Sanamyan 2020).

!*Lecidella asema* (Nyl.) Knoph & Hertel – Top 001, on rock 3701 (Fig. 2C). The species usually grows on supralittoral rocks and rocks in coastal mountains, known from Europe, Macaronesia, America, Asia and Africa (Smith et al. 2009). In the Russian Far East, the species is known from Primorye Territory (Davydov et al. 2021).

!*Lendemeriella kamczatica* (Savicz) I. V. Frolov – Mat 006, Mat 008, Mat 009, on bark of *Duschekia fruticosa*, 2075, 2077, 2079, 2080, 2081, 2082, 2084, 2085, 2089, 2093, 2094, 2095, 2096 (Fig. 2D). The species occurs on bark of deciduous trees such as birch, alder and willow, often in floodplain forests; distributed along the seacoast of the North Pacific region (Khodosovtsev et al. 2004, Frolov & Gagarina 2020).

!*Lepra panyrga* (Ach.) Hafellner – Mat 081, Mat 082, on dead moss on soil, 3625, 3678 (Fig. 2E). The species grows on dead mosses, lichens, plant debris and soil, rarely on tree trunks mostly in Arctic and Subarctic regions, very rare in mountains in the south, distributed in Europe, Asia, North and South America (Makarevich 1971, Stenroos et al. 2016). In the Russian Far East, the species is known from Chukotka Autonomous Area and Republic of Sakha (Andreev et al. 1996), Kamchatka Territory (Himmelbrant et al. 2019) and Magadan Region (Kotlov 1995).

\**Lobaria limata* (Ach.) Rabenh. – Mat 081, on soil, 3154, 3175.

*Melanohalea olivacea* (L.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch – Mat 008, on bark of *Duschekia fruticosa*, 3272, 3275. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).

\**Micarea incrassata* Hedl. – Mat 081, on soil, 3702.

*Ochrolechia frigida* (Sw.) Lyngby – Mat 081, on soil, 3152, 3164, 3640, 3646. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).

\**Parmelia fertilis* Müll. Arg. – Mat 007, Mat 008, Mat 009, on bark of *Duschekia fruticosa*, 2115, 3153, 3169, 3170, 3171, 3172, 3173, 3174, 3275, 3283, 3637.

\**Parmelia omphalodes* (L.) Ach. – Mat 011, Mat 081, Mat 311, on soil, rock, 3152, 3167, 3260, 3268, 3281, 3282, 3661, 3675, 3647, 3160, 3157.

*Parmelia saxatilis* (L.) Ach. – Mat 012, on rock, 3677. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).

\**Parmelia shinanoana* Zahlbr. – Mat 081, on soil, 3152, 3162, 3168.

\**Parmelia sulcata* Taylor – Mat 011, on rock, 2087, 3276, 3277, 3636.

\**Parmeliopsis hyperopta* (Ach.) Vain. – Mat 006, Mat 012, on bark of *Duschekia fruticosa*, wood, 3165, 3176, 3178, 3256, 3655.

\**Peltigera degenii* Gyeln. – Mat 011, on rock, 3266, 3267.

*Peltigera membranacea* (Ach.) Nyl. – Mat 081, on soil, 3155, 3159. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).

\**Peltigera polydactylon* (Neck.) Hoffm. – Mat 011, on mossy rock, 3265.

\**Peltigera rufescens* (Weiss) Humb. – Mat 011 on mossy rock, 3675.

\**Pertusaria leioplaca* (Ach.) DC. – Mat 007, on bark of *Duschekia fruticosa*, 3673, 3669.

*Physcia caesia* (Hoffm.) Fűrnr. – Mat 081, Mat 082, on soil and concrete, 3182, 3625. The species was previously reported for Matua (Ezhkin et al. 2023).

*Physcia dubia* (Hoffm.) Lettau – Top 011, on rock, Romanjuk 3179, 2090. The species was previously reported for Matua (Ezhkin et al. 2023).

\**Polycauliona candelaria* (L.) Frödén, Arup & Søchting – Mat 011, Mat 012, Mat 081, Top 001, on rock, soil, 2086, 3181, 3629, 3664, 3679.

- \**Polyozosia straminea* (Ach.) S.Y. Kondr., Lökös & Farkas – Mat 081, Top 001, on rock, soil, 3180, 3181, 3183, 3627, 3628, 3629, 3632, 3641, 3672, 3679.
- \**Protoparmelia badia* (Hoffm.) Hafellner – Mat 011, Mat 012, Top 001, on rock, 3179, 3279, 3285, 3626, 3629, 3634, 3651, 3653, 3659, 3660, 3662, 3668, 3698.
- Protoparmeliopsis muralis* (Schreb.) M. Choisy – Mat 011, Top 001, on rock, 2087, 2088, 2090, 3649, 3664, 3668, 3179. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).
- Psoroma hypnorum* (Vahl) Gray – on soil (Sanamyan & Sanamyan 2020).
- \**Ramalina almqvistii* Vain. – Mat 012, on rock, 3261.
- \**Ramalina pertusa* Kashiw. – Mat 012, on wood, 3255, 3256, 3257.
- Ramalina scoparia* Vain. – Top 001, on rock, 3674. The species was previously reported for Matua (Joneson et al. 2004).
- \**Rhizocarpon geographicum* (L.) DC. – Mat 011, Mat 012, Top 001, on rock, 3179, 3653, 3659, 3668.
- Rinodina ascociscana* (Tuck.) Tuck. – on plant debris and mosses (Ezhkin et al. 2023).
- Rinodina turfacea* (Wahlenb.) Körb. – on plant debris and deadwood (Ezhkin et al. 2023).
- Rusavskia elegans* (Link) S.Y. Kondr. & Kärnefelt – Mat 012, Mat 082, on concrete, rock, 2074, 2078, 2086, 2091, 2097, 2099, 2111, 2117, 3177, 3182, 3284, 3638. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).
- Sphaerophorus fragilis* (L.) Pers. – Mat 081, Mat 082, on soil, 3640, 3645, 3646, 3670 (SAK). The species was previously reported for Matua (Sanamyan & Sanamyan 2020).
- \**Tephromela atra* (Huds.) Hafellner – Mat 012, on rock, 2086.
- Tetramelas chloroleucus* (Körb.) A. Nordin – on bark of *Duschekia fruticosa* (Ezhkin et al. 2023).
- Thamnotia vermicularis* (Sw.) Schaer. – Mat 081, on soil, 3158, 86. The species was previously reported for Matua (Sanamyan & Sanamyan 2020).
- \**Umbilicaria torrefacta* (Lightf.) Schrad. – Mat 311, on rock, 3258, 3259, 3260, 3262, 3263, 3264.
- !!*Verrucaria fusconigrescens* Nyl. – Top 001, Mat 011, on rock 3698, 3700, 3701 (Fig. 2F). The species usually grows near the coast on xeric-supralittoral rocks to sometimes many kilometres inland, frequent (Smith et al. 2009), known in Northern Europe (Pykälä 2007, Nordin et al. 2011) and North America, Asia, Tasmania (Smith et al. 2009). In Russia, the species is reported only from Bol'shoi Berezovoy Island, Leningrad Region (Himelbrant et al. 2013).
- \**Verrucoplaca verruculifera* (Vain.) S.Y. Kondr., Kärnefelt, Elix, A. Thell, Jung Kim, M.H. Jeong, N.N. Yu, A.S. Kondr. & Hur – Top 001, on rock, 3181, 3183, 3628, 3629, 3630, 3632, 3672, 3680, 3685.
- \**Vulpicida pinastri* (Scop.) J.-E. Mattsson & M.J. Lai – Mat 007, on bark of *Duschekia fruticosa*, 3697.

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