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Revisions of some lichens and lichenicolous fungi from Antarctica

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Abstract: *Arthonia subantarctica* Øvstedal, *Heterocarpon follmannii* Dodge, *Thelidiola eklundii* Dodge and *Thelidium minutum* Dodge were found to be based on discordant elements of lichenized and lichenicolous fungi and are lectotypified on the lichenicolous fungi. The new combination *Polycoccum follmannii* (Dodge) Alstrup is made. *Thelidiola* Dodge is a synonym of *Muellerella* Hepp ex Müll. Arg., *Catillaria cremea, Thelidiola eklundii* and *Thelidium minutum* becomes synonyms of *Carbonea vorticosa, Muellerella pygmaea* and *Muellerella lichenicola* respectively.

Kokkuvõte: Parandusi mõnede Antarktika samblike ja lihhenikoolsete seente taksonoomias.

Arthonia subantarctica Øvstedal, *Heterocarpon follmannii* Dodge, *Thelidiola eklundii* Dodge ja *Thelidium minutum* Dodge leiti baseeruvat lihheniseerunud ja lihhenikoolsete seente ühtesobimatutel elementidel ja on lektotüpiseeritud lihhenikoolsete seentena. Esitatakse uus kombinatsioon *Polycoccum follmannii* (Dodge) Alstrup. *Thelidiola* Dodge on *Muellerella* Hepp ex Müll. Arg. sünonüüm; *Catillaria cremea, Thelidiola eklundii* ja *Thelidium minutum* sobivad vastavalt *Carbonea vorticosa, Muellerella pygmaea* ja *Muellerella lichenicola* sünonüümideks.

INTRODUCTION

The Antarctic lichens and lichenicolous fungi have mostly been treated by lichenologists unfamiliar with the arctic species, which has led to many taxa being described from both areas. Especially the works of Dodge (1948, 1968, 1973), Dodge & Baker (1938) and Dodge & Rudolph (1955) caused much confusion, as the descriptions were often unprecise. The revisions by Castello & Nimis (1994, 1995) solved many taxonomic problems related to the lichenized species. In the present paper some species described as lichenicolous or as lichenized but supposed to be lichenicolous were studied.

RESULTS

ARTHONIA SUBANTARCTICA Øvstedal
Norsk Polarinstitutt Skrifter 185: 36, 1986. Holotype: Bouvetøya, NW coast, Nyrøysa, NW of Summit Point (hill 51), alt. 30 m, T. Engelskjøn 001.1 (BG!).

The taxon was described as being lichenized but the study of the holotype showed it to be a lichenicolous *Arthonia* species parasitic on *Buellia babingtonii* (Hooker & Taylor) M. Lamb ex Dodge. Being based on discordant elements, the lichenicolous fungus is here selected as lectotype. The species seems not to have been described earlier, and the name *Arthonia subantarctica* Øvstedal should accordingly be used for the parasite.

The infected thalli of *Buellia babingtonii* are very rarely fertile, and the areoles turn brown before they are destroyed. The holotype is a mosaic of infected and uninfected *B. babingtonii* and *Caloplaca sublobulata*, the latter species is able to overgrow infected *Buellia* thalli but is itself partly overgrown by healthy *Buellia*. The species was reported from South Shetland Islands, Deception Island by Aptroot & Knaap (1993). They did not notice its lichenicolous nature.

CATILLARIA CREMEA Dodge & Baker
Ann. Missouri Bot. Garden 25: 544–545, 1938. Type: Marie Byrd Land, Edsel Ford Range, Skua Gull Peak, P. Siple & S. Corey 72W-8 (FH!).

The holotype was identified as *Carbonea vorticosa* (Flörke) Hertel, consequently *Catillaria cremea* is a synonym of that species.

POLYCOCCUM FOLLMANNII (Dodge) Alstrup comb. nov.
Basionym: *Heterocarpon follmannii* Dodge, Nova Hedwigia 15: 304–305, 1968. Holotype: South Shetland Islands, Greenwich Island, Follmann 14108-D (FH!). Fig. 1.

Heterocarpon follmannii is based on discordant elements, being a species of *Polycoccum* growing

parasitically on *Lecidea cremoricolor* Hue. The lichenicolous fungus is hereby selected as the lectotype, and the new combination becomes necessary.

Dodge (l.c.) gave the ascospores as 15–18 × 6 µm, but I measured 17–18.5 × 8–10 µm for the ripe spores; they are smooth-walled with rounded ends and slightly constricted at the septa. Three to four spores were seen in each ascus. The species is only known from the holotype.

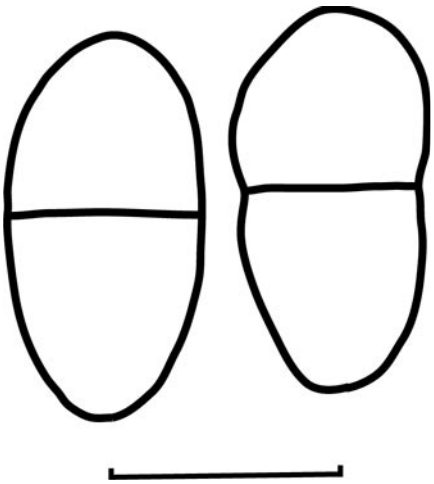

Fig. 1. *Polycoccum follmannii*, holotype, ascospores. Scale = 10 µm.

THELIDIOLA EKLUNDII Dodge
Nova Hedwigia 15: 300, 1968. Holotype: (Hub?) Nunatak (68°00'S, 66°47'W?) on coarse white granite pebbles, Carl Eklund B-6-A, US Antarctic Service Expedition 56 (FH!).

The genus *Thelidiola* Dodge, with *T. eklundii* as type species, was described as being lichenized with *Trebouxia* algae. However, study of the type species showed that it was a lichenicolous fungus, *Mullerella pygmaea* (Körber) D. Hawksw., parasitic on an unknown lichenized thallus. The lichenicolous fungus is here selected as the lectotype, rendering *Thelidiola* Dodge a synonym of *Muellerella* Hepp ex Müll. Arg., and *T. eklundii* a synonym of *M. pygmaea*.

THELIDIUM MINUTUM Dodge
Nova Hedwigia 15: 301, 1968. Holotype: Victoria Land, southeast of Lake Penny, Walcott Glacier Area, K. P. Rennell com. E. Schofield AA-135, parasymbiotic on the thallus of *Lecanora lavae* Darb. (FH!).

Although called parasymbiotic, Dodge described a thallus 15 µm thick consisting of periclinal hyphae surrounding the perithecia without mentioning a symbiont, the perithecia being 300 µm in diam. and immersed in the host thallus.

Study of the holotype showed that the parasitic fungus was identical with *Muellerella lichenicola* (Sommerf. ex Fr.) D. Hawksw., and *Thelidium minutum* Dodge thereby becomes a synonym of *M. lichenicola*. The host species given as *Lecanora lavae* Darb. is *Rhizoplaca melanophthalma* (DC) Leuckert & Poelt.

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REFERENCES

Aptroot, A. & van der Knaap, W. O. 1993. The lichen flora of Deception Island, South Shetland Islands. *Nova Hedwigia* 56: 183–192.

Castello, M. & Nimis, P. L. 1994. Critical notes on the genus *Candelariella* (Lichenes) in Antarctica. *Acta Bot. Fennica* 150: 5–10.

Castello, M. & Nimis, P. L. 1995. A critical revision of Antarctic lichens described by C. W. Dodge. In *Studies in licenology with emphasis on chemotaxonomy, geography and phytochemistry Festschrift Ch. Leuckert* (eds Knoph, J.-G., Schrüfer, K. & Sipman, H. J. M). *Bibliotheca Lichenologica* 57: 71–92.

Dodge, C. W. 1948. Lichens and lichen parasites. *BANZ Antarctic Research Expedition 1929–1931*. Reports series B: 7.

Dodge, C. W. 1968. Lichenological Notes on the flora of the Antarctic continent and the subantarctic islands VII and VIII. *Nova Hedwigia* 15: 285–332.

Dodge, C. W. 1973. *Lichen Flora of the antarctic continent and adjacent islands*. Phonix Publishing, Cannan, New Hampshire: 399 pp.

Dodge, C. W. & Baker, G. E. 1938. Lichens and lichen parasites. *Ann. Missouri Bot. Garden* 25: 515–718.

Dodge, C. W. & Rudolph, E. D. 1955. Lichenological notes on the flora of the antarctic continent and the subantarctic islands I-IV. *Ann. Missouri Bot. Garden* 41: 131–149.

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Lichens from Ammassalik Ø, Southeast Greenland

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Abstract: A total of 200 taxa of lichens are reported from two localities on Ammassalik Ø in Southeast Greenland. *Aspicilia montana*, *Porocyphus coccodes* and *Porpidia thomsonii* are reported as new to Greenland. 9 species are new to East Greenland, viz. *Candelariella dispersa*, *Koerberiella wimmeriana*, *Lecidea antiloga*, *Mycoblastus alpinus*, *Pyrenopsis furfurea*, *Rimularia impavida*, *Spilonema revertens*, *Verrucaria ceuthocarpa* and *V. mucosa*. 32 species are new to Southeast Greenland, viz. *Amandinea cacuminum*, *Aspicilia aquatica*, *A. mastoidea*, *A. mastrucata*, *Bellemerea cinereorufescens*, *Biatora subduplex*, *Buellia aethalea*, *Calvitimela armeniaca*, *Candelariella terrigena*, *Cystocoleus ebeneus*, *Ephebe hispidula*, *Epilichen scabrosus*, *Lecanora fuscescens*, *Lecidea leucothallina*, *L. tesselata*, *Leprocaulon subalbicans*, *Leptogium saturninum*, *Lopadium pezizoideum*, *Miriquidica garovaglii*, *Mycobilimbia lobulata*, *Polyblastia cupularis*, *Polysporina simplex*, *Polychidium muscicola*, *Porpidia flavicunda*, *Rhizocarpon bolanderi*, *R. grande*, *Rimularia furvella*, *Staurothele areolata*, *Stereocaulon glareosum*, *S. incrustatum*, *Verrucaria nigrescens* and *Vestergrenopsis isidiata*. Geology, climate and vegetation of the localities are briefly treated.

Kokkuvõte: E. S. Hansen. Ammassalik Ø (Kagu-Gröönimaa) samblikud.

Ammassalik Ø piirkonna (Kagu-Gröönimaa) kahes leiukohas on tuvastatud 200 samblikuliigi esinemine. *Aspicilia montana*, *Porocyphus coccodes* ja *Porpidia thomsonii* on esmasleiud Gröönimaalt. Ida-Gröönimaa esmasleiud esindavad 9 liiki:*Candelariella dispersa*, *Koerberiella wimmeriana*, *Lecidea antiloga*, *Mycoblastus alpinus*, *Pyrenopsis furfurea*, *Rimularia impavida*, *Spilonema revertens*, *Verrucaria ceuthocarpa* ja *V. mucosa*. 32 liiki on nüüd esmakordselt määratud ka Kagu-Gröönimaalt: *Amandinea cacuminum*, *Aspicilia aquatica*, *A. mastoidea*, *A. mastrucata*, *Bellemerea cinereorufescens*, *Biatora subduplex*, *Buellia aethalea*, *Calvitimela armeniaca*, *Candelariella terrigena*, *Cystocoleus ebeneus*, *Ephebe hispidula*, *Epilichen scabrosus*, *Lecanora fuscescens*, *Lecidea leucothallina*, *L. tesselata*, *Leprocaulon subalbicans*, *Leptogium saturninum*, *Lopadium pezizoideum*, *Miriquidica garovaglii*, *Mycobilimbia lobulata*, *Polyblastia cupularis*, *Polysporina simplex*, *Polychidium muscicola*, *Porpidia flavicunda*, *Rhizocarpon bolanderi*, *R. grande*, *Rimularia furvella*, *Staurothele areolata*, *Stereocaulon glareosum*, *S. incrustatum*, *Verrucaria nigrescens* ja *Vestergrenopsis isidiata*. Töös käsitletakse põgusalt kogumispiirkonna geoloogiat, kliimat ja taimkatet.

INTRODUCTION

The author investigated the lichen flora of the surroundings of Tasiilaq in the late June and July 1985 and in the vicinitity of the Sermilik Station in August 2001. Both localities are situated in the southern part of Ammassalik Ø with the Ammassalik Fjord to the east and the Sermilik Fjord to the west of the island. Vegas Fjeld (1084 m) and Polhems Fjeld (1030 m) are the highest mountains in the area. Tasiilaq has a sheltered position at the western coast of Kong Oskars Havn, while the Sermilik Station is situated just north of Ikáteq and east of the largest single glacier on Ammassalik Ø, the Mittavakkat Gletscher. An important purpose of the lichenological studies carried out in 2001 was to start measurements of lichen growth in front of the glacier. In 1985 my attention primarily focussed on the lichen flora occurring on charnokitic rocks and that growing on gneissic rocks.

Comprehensive surveys of the lichen flora of Southeast Greenland have previously been given by Dahl, Lynge & Scholander (1937), Daniels (1975, 1982) and E. S. Hansen (1978).

Localities and geology

The following two localities on Ammassalik Ø were investigated by the author in the summer of 1985 and the summer of 2001, respectively (Fig. 1).

1. Tasiilaq. 65°36'N, 37°38'W. Alt. 0–600 m. 27 June – 16 July 1985 & 7–8 August 2001 & 23–24 August 2001. Archaean garnet gneisses intersected by basic dykes. However, the bedrock of Tasiilaq is mainly composed of charnokite, a basic norite rich in hypersthene (Mg, Fe) SiO_3. It weathers rather easily and forms gravelly talus slopes, which can be observed in several places near the town.
2. The Sermilik Station. 65°41'N, 37°55'W. Alt. 0–250 m. 9–22 August 2001. Archaean garnet gneisses and different intrusive rocks and dykes (Bridgwater & Gormsen, 1968, Wright et al., 1973).

Climate

Ammassalik Ø has low arctic and oceanic climate. According to measurements made by Asiaq/Grønlands Forundersøgelser the mean temperature of the warmest month, July, is 10°C at Tasiilaq, whereas the mean temperature of the coldest month, February, is –20°C. The mean annual precipitation is 951 mm (2000). Tasiilaq is located in the largest ice-free area on the Southeast coast of Greenland.

MATERIAL AND METHODS

Lichens were collected at numerous sample plots at the two localities situated on Ammassalik Ø. The collected material, a total of 650 specimens of lichens, was studied with Zeiss light microscopes. Selected specimens of *Buellia, Lepraria* and *Stereocaulon* were identified by means of HPTLC. The material is deposited at the Botanical Museum, University of Copenhagen (C).

RESULTS AND DISCUSSION

About 80 lichens have previously been reported from Ammassalik Ø (Daniels, 1968, 1975, 1982; Daniels & Ferwerda, 1972; Daniels, E. S. Hansen & Sipman, 1985; E. S. Hansen, 1978, 1986; E. S. Hansen, Poelt & Søchting, 1987; Moberg & E. S. Hansen, 1986; Thomson, 1997). Most of these lichens have been found by the author in connection with the present investigation. Ammassalik Ø belongs floristically to Southeast Greenland. Scoresby Sund marks the boundery-line between Southeast Greenland and the remaining part of East Greenland. The three species, which are reported new to Greenland, viz. *Aspicilia montana*, *Porocyphus coccodes* and *Porpidia thomsonii*, are rare and easily neglected.

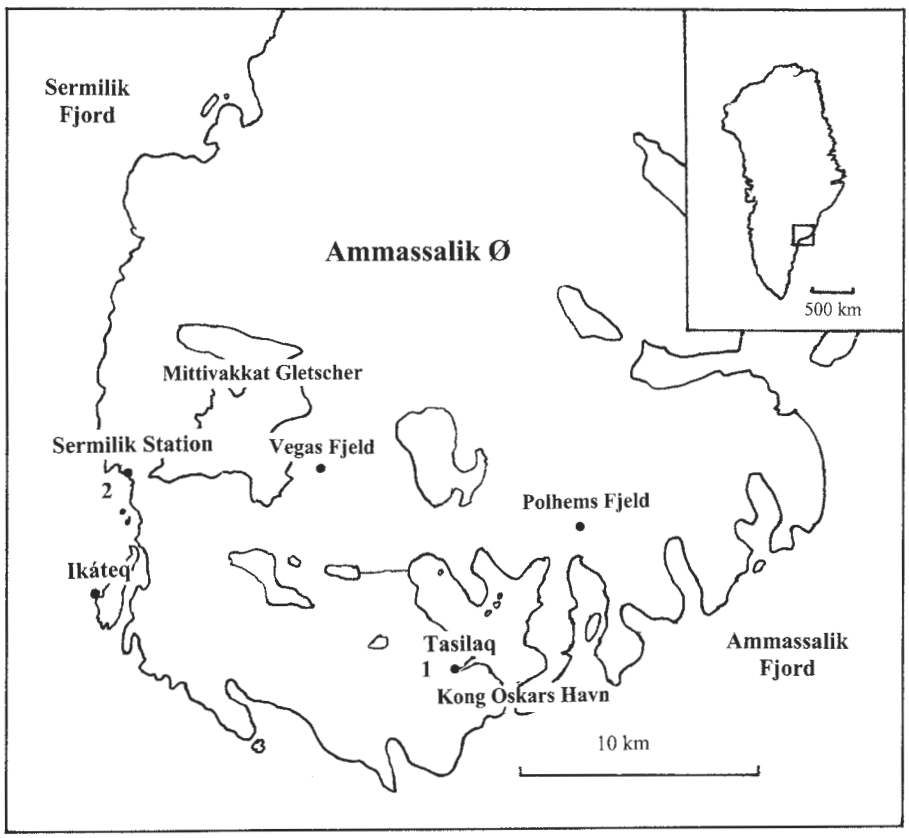

Fig. 1. Location of investigation area in Southeast Greenland. 1 – Tasiilaq. 2 – Sermilik Station. The small Greenland map shows the situation of the investigation area.

Selected, mostly rare species of particular interest among the remaining lichens are listed together with the references in the following:

Arctomia delicatula Th. Fr. (Daniels, 1982).
Buellia geophila (Flörke ex Sommerf.) Lynge (Daniels & Ferwerda, 1972).
Buellia leptocline (Flot.) A. Massal. (Daniels, 1975).
Buellia notabilis Lynge (Daniels, 1975).
Caloplaca tornoënsis H. Magn. (Daniels, E. S. Hansen & Sipman, 1985).
Parmeliella arctophila (Th. Fr.) Malme (Daniels, E. S. Hansen & Sipman, 1985).
Phaeophyscia endococcina (Körb.) Moberg (Moberg & E. S. Hansen, 1986).
Phaephyscia orbicularis (Neck.) Moberg (Daniels & Ferwerda, 1972).
Physcia tenella (Scop.) DC. (Moberg & E. S. Hansen, 1986).
Placynthiella oligotropha (J.R. Laundon) Coppins & P. James (Daniels, E. S. Hansen & Sipman, 1985).
Rinodina conradi Körb. (Daniels, E. S. Hansen & Sipman, 1985).
Stereocaulon condensatum Hoffm. (Daniels & Ferwerda, 1972).

General remarks on the lichen vegetation

The terricolous lichen vegetation on Ammassalik Ø is strongly influenced by its lowarctic, oceanic climate and mainly acid soils. The lichens mentioned in the following are generally abundantly occurring in the communities, where they belong. Snow-patch communities dominated by *Salix herbacea* and rich in lichens such as *Cetrariella delisei*, *Cladonia ecmocyna*, *Lecidoma demissum*, *Lepraria neglecta*, *Peltigera malacea*, *Solorina crocea* and *Stereocaulon alpinum* are widely distributed on the island. *Empetrum hermaphroditum-Vaccinium* heaths are commonly occurring, too, particularly in the lowland, where they probably represent the climax vegetation (Daniels, 1982). The heaths occur both along the coast and in inland sites. They are comparatively rich in lichens such as *Cetraria islandica*, *Cladonia amaurocraea*, *C. crispata*, *C. ecmocyna*, *C. mitis*, *C. phyllophora*, *C. stygia*, *Ochrolechia frigida*, *Peltigera malacea*, *Pertusaria oculata* and *Stereocaulon alpinum*. The *Empetrum-Vaccinium* heaths have, however, an extremely varied composition compared with other dwarf shrub communities occurring in the area. The occurrence of *Phyllodoce coerulea-Salix glauca* heaths is another characteristic feature of Ammassalik Ø. They occur in sheltered places at the foot of steep rocks and in depressions and contain many lichens, e.g., *Cladonia borealis*, *C. mitis*, *Peltigera scabrosa* and *Stereocaulon alpinum*. Moist depressions in the heaths are often densely covered by *Cetrariella delisei* and *Cladonia stricta*.

Among the more dry heath types the *Empetrum-Betula nana* heaths are of particular interest. They occur in wind exposed sites without snow cover during winter and are usually very rich in lichens such as, e.g., *Alectoria nigricans*, *Cetraria muricata*, *Cladonia amaurocraea*, *C. mitis*, *Flavocetraria nivalis*, *Sphaerophorus globosus* and *Stereocaulon alpinum*. The two last mentioned species are the dominant lichens in some dwarf shrub heaths. A *Kobresia myosuroides-Vaccinium uliginosum* community with a more restricted occurrence on Ammassalik Ø is related to other steppe-like communities in Greenland (E. S. Hansen, 2001). It contains lichens such as *Arctomia deliculata, Cetraria islandica*, *Cladonia gracilis*, *Peltigera rufescens*, *Stereocaulon alpinum* and *S. paschale* (Daniels, 1982). *Dryas integrifolia* is the dominant dwarf shrub species in some areas with a very thin snow cover in winter. The Dryas communities are fairly rich in lichens, e.g., *Caloplaca tetraspora*, *Cladonia macrophyllodes*, *Flavocetraria nivalis*, *Ochrolechia frigida* and *Rinodina mniaraea*. The last mentioned species has not been reported from Ammassalik Ø so far. Sloping ground in sheltered places between rocky ridges are often covered by a characteristic *Viscaria alpina* community rich in *Cladonias* such as *C. crispata*, *C. mitis*, *C. ecmocyna*, *C. phyllophora* and *C. stygia* and other lichens, e.g., *Cetraria islandica*, *Peltigera malacea* and *Stereocaulon alpinum*. A *Loiselaria procumbens* community with lichens such as *Cladonia borealis*, *C. uncialis*, *Ochrolechia frigida* and *Solorina crocea* occurs locally on the ridges and plateaus, which are usually wind exposed and almost bare during winter.

Very few reports on epiphytic lichens are available from Southeast Greenland. Dahl, Lynge & Scholander (1937) reported on the occurrence of *Cetraria sepincola* at Møretun in Lindenowfjord, and the author collected *Imshaugia aleurites* and *Parmeliopsis ambigua* on *Juniperus communis* at Dronning Marias Dal

in Skjoldungen (E. S. Hansen, 1978). 5 species of lichens, viz. *Buellia papillata*, *Japewia tornoënsis*, *Lecanora boligera*, *Lecidea antiloga* and *Rinodina turfacea*, were found growing on twigs of *Juniperus communis* and one species, viz. *Lecanora fuscescens*, was collected on twigs of *Salix glauca*, during the present investigation. Extensive scrubs of *Salix glauca* cover the basal part of the mountains at the head of the large fjords just north of Ammassalik Ø. These scrubs are potential habitats for epiphytic lichens, which probably will begin to colonized them under more favourable climatic conditions.

The saxicolous lichen vegetation on Ammassalik Ø is fairly rich and well developed. About fifty taxa of lichens were found growing on both charnokitic and gneissic rocks and almost the same number of lichens were found on charnokite alone. A dozen lichen species were collected on gneiss, only. No definite conclusions as to the total number of species in the different habitats can be drawn from these figures. However, the two types of rocks differ as regards mineral composition, texture and degree of hardness, parametres, which probably influence the composition of the lichen flora. The relatively high metal contents of the charnokite and some limonite-covered gneisses are reflected in the frequent occurrence of rust-stained lichens such as *Acarospora sinopica*, *A. smaragdula*, *Lecidea silacea, Miriquidica atrofulva*, *Porpidia flavicunda*, *P. flavocoerulescens*, *P. melinodes* and *Tremolecia atrata* (E. S. Hansen, 1999; Purvis & Halls, 1996). These lichens were in particular found growing on the lower, moist part of boulders and rocks and on stones, which are temporarily moistened by melt water (E. S. Hansen, 1986, 1999). Seapage rocks without distinct limonite crusts are usually covered by lichens without a rust-stained thallus, e.g., *Ephebe hispidula*, *Koerberiella wimmeriana*, *Lecanora chloroleprosa*, *Phylliscum demangeonii*, *Placynthium asperellum* (often infected by *Caloplaca castellana*), *Rhizocarpon badioatrum*, *Spilonema revertens* and *Vestergrenopsis elaeina*. Strongly weathered charnokitic rocks and boulders hold lichens such as *Caloplaca fraudans* and *Placopsis gelida*, while other species, e.g., *Calvitimela armeniaca* and *Sporastatia testudinea* prefer hard rocks. Projecting rocks and boulders with guano on the top are often covered by ornithocoprophilous lichens belonging to the genera, *Amandinea, Aspicilia, Caloplaca, Candelariella, Melanelia, Parmelia, Physcia, Protoparmelia, Umbilicaria* and *Xanthoria*. This very characteristic community is known from all parts of Greenland (E. S. Hansen, 1995). *Acarospora molybdina* and *Caloplaca alcarum* grow most abundantly near sea. *Verrucaria ceuthocarpa*, *V. maura* and *V. mucosa* grow in marine habitats, but often do not form distinct zones on the rocks.

Annotated list of lichens

The following list of lichens is based on the author's collections. Some lecideoid and leprose, crustose lichens have been neglected during the present investigation. Nomenclature follows Santesson (1993) with some exceptions. Numbers 1, 2 indicate the two localities listed above. Annotations are given as regards the substrate of the lichens and presence of apothecia (ap.) or perithecia (per.)."st." means that the specimen is sterile. The frequency is mentioned, where it was possible to estimate it. Collections, which have been distributed previously from herbarium C as part of "Lichenes Groenlandici Exsiccati" (LGE), are stated by their numbers. Selected references are cited.

Acarospora molybdina (Wahlenb.) A. Massal. 2. On gneissic rocks partly covered by a thin layer of limonite; ap.; locally abundant. New to Ammassalik Ø.

A. sinopica (Wahlenb.) Körb. 1. On rocks composed of charnokite and other siliceous rocks with high contents of iron; ap.; common on Ammassalik Ø, but otherwise very rare in East Greenland (E. S. Hansen, 1995).

A. smaragdula (Wahlenb.) A. Massal. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Miriquidica atrofulva* and *Tremolecia atrata*; ap.; rare.

Alectoria nigricans (Ach.) Nyl. 2. On soil; ap.

Allantoparmelia alpicola (Th. Fr.) Essl. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Pseudephebe minuscula*, *Tremolecia atrata* and *Umbilicaria torrefacta*; ap.

Amandinea cacuminum (Th. Fr.) H. Mayrhofer & Sheard. 1. On charnokitic and gneissic rocks manured by birds, together with, e.g., *Candelariella vitellina*, *Lecanora polytropa* and *Xanthoria borealis*; ap. The taxon has recently been moved from *Rinodina* to *Amandinea* because of its pigmented hypothecium, filiform conidia and incomplete

thalline margin (Mayrhofer & Sheard, 2002). New to Southeast Greenland.

Arthrorhaphis alpina (Schaer.) R. Sant. 1. On soil; st.

A. citrinella (Ach.) Poelt. 1, 2. On soil; st.

Aspicilia aquatica Körb. 1, 2. On charnokitic and gneissic rocks; ap. New to Southeast Greenland.

A. caesiocinerea (Nyl. ex Malbr.) Arnold. 1. On rocks manured by birds composed of charnokite; ap.

A. mastoidea (Lynge) Thomson. 1, 2. On charnokitic and gneissic rocks; ap. New to Southeast Greenland.

A. mastrucata (Wahlenb.) Th. Fr. 1, 2. On charnokitic and gneissic rocks; ap. New to Southeast Greenland.

A. montana (H. Magn.) Hav. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Lecanora polytropa*, *Melanelia hepatizon* and *Umbilicaria torrefacta*; st. New to Greenland. Previously reported from Scandinavia (Magnusson, 1952).

Baeomyces rufus (Huds.) Rebent. 1, 2. On soil and dead mosses; st.

Bellemerea cinereorufescens (Ach.) Clauzade & Cl. Roux. 1. On charnokitic rocks; ap.; rare. New to Southeast Greenland.

B. subsorediza (Lynge) R. Sant. 2. On siliceous rocks, together with *Lecanora leucococca* and *Rhizocarpon geographicum*; st.; rare. New to Ammassalik Ø.

Biatora cuprea (Sommerf.) Fr. 1, 2. On mosses, plant remains and soil; ap. New to Ammassalik Ø.

B. subduplex (Nyl.) Räsänen ex Printzen. 1. On mosses; ap.; rare. Perhaps only a form of *B. vernalis* (Thomson, 1997). New to Southeast Greenland.

B. vernalis (L.) Fr. 1. On soil rich in humus; ap.

Bryonora castanea (Hepp) Poelt. 1, 2. On mosses and plant remains; ap. New to Ammassalik Ø.

Buellia aethalea (Ach.) Th. Fr. 1. On charnokitic rock; ap. Thallus contains norstictic acid (HPTLC). New to Southeast Greenland.

B. papillata (Sommerf.) Tuck. 1. On twigs of *Juniperus communis*; ap.

Caloplaca alcarum Poelt. 1. On *Lecanora contractula* on charnokitic rocks; ap.

C. arenaria (Pers.) Müll. Arg. 1. On charnokitic rocks; ap.

C. castellana (Räsänen) Poelt. 1. On *Placynthium asperellum* on charnokitic rocks; ap.

C. exsecuta (Nyl.) Dalla Torre & Sarnth. 1. On boulder composed of charnokite; ap.

C. fraudans (Th. Fr.) H. Olivier. 1, 2. On strongly weathered charnokitic and gneissic rocks; ap.

C. jungermanniae (Vahl) Th. Fr. 1. On mosses and plant remains; ap.

C. lithophila H. Magn. 1. On charnokitic rock; ap.

C. livida (Hepp) Jatta. 1. On plant remains; ap.

C. nivalis (Körb.) Fr. 1. On mosses; ap.

C. tetraspora (Nyl.) H. Olivier. 1. On mosses; ap.

Calvitimela armeniaca (DC.) Hafellner. 1, 2. On gneissic rocks, together with, e.g., *Rhizocarpon geographicum*, *R. superficiale* and *Sporastatia testudinea*; ap. New to Southeast Greenland.

Candelariella dispersa (Räsänen) Hakul. 1. On *Placynthium asperellum* on charnokitic rock; st. New to East Greenland.

C. placodizans (Nyl.) H. Magn. 1, 2. On mineral soil; st.

C. terrigena Räsänen. 1, 2. On mosses, gravelly soil and soil rich in humus; ap. New to Southeast Greenland.

C. vitellina (Hoffm.) Müll. Arg. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Lecanora intricata* and *Xanthoria elegans*; ap.; common.

Cetraria islandica (L.) Ach. 1, 2. On soil; ap. LGE 849.

C. muricata (Ach.) Eckfeldt. 1, 2. On soil; st.

Cetrariella delisei (Bory ex Schaer.) Kärnefelt & A.Thell. 2. On soil; st.

Chaenotheca furfuracea (L.) Tibell. 2. On dead mosses; ap.; rare. New to Ammassalik Ø.

Cladonia amaurocraea (Flörke) Schaer. 2. On *Racomitrium lanuginosum* on soil, together with *Cetraria muricata*; st.

C. bellidiflora (Ach.) Schaer. 1, 2. On soil and mosses, together with *Cladonia borealis*, *C. stricta*, *Pertusaria oculata* and *Solorina crocea*; ap.

C. borealis S. Stenroos. 1, 2. On soil and mosses; ap.; common.

C. cariosa (Ach.) Spreng. 2. Among mosses on mineral soil, together with *Cladonia borealis* and *C. pyxidata*; ap.; rare.

C. carneola (Fr.) Fr. 1, 2. On soil and mosses; st.

C. CHLOROPHAEA (Flörke ex Sommerf.) Spreng. 1, 2. On soil and mosses; st.
C. CRISPATA (Ach.) Flot. 1, 2. Among mosses on soil; st.
C. CYANIPES (Sommerf.) Nyl. 2. On soil; st.
C. ECMOCYNA Leight. 2. On soil, together with *Solorina crocea*; st.
C. GRACILIS (L.) Willd. 2. On soil; st.
C. LUTEOALBA Wheldon & A. Wilson. 1. On soil rich in humus; st.; rare.
C. MACROPHYLLA (Schaer.) Stenh. 2. On soil; st.
C. MACROPHYLLODES Nyl. 1, 2. On mosses, plant remains and soil rich in humus, together with, e.g., *Cladonia pyxidata* and *Rinodina turfacea*; ap.; common. LGE 850.
C. MITIS Sandst. 1, 2. On soil; st.; common.
C. PHYLLOPHORA Hoffm. 1, 2. On soil rich in humus, together with *Cetraria islandica*, *Cladonia bellidiflora* and *C. mitis*; st.; common.
C. PLEUROTA (Flörke) Schaer. 1, 2. On soil rich in humus; st.
C. PYXIDATA (L.) Hoffm. 2. On soil, together with, e.g., *Cladonia borealis* and *C. cariosa*; st.
C. SQUAMOSA Hoffm. 2. On soil; st.
C. STRICTA (Nyl.) Nyl. 1, 2. On soil, together with, e.g., *Cladonia bellidiflora*; st.; common.
C. STYGIA (Fr.) Ruoss. 2. On soil; st.
C. UNCIALIS (L.) Weber ex F. H. Wigg. 2. On soil; st.
CYSTOCOLEUS EBENEUS (Dillwyn) Thwaites. 1. On mosses; st. New to Southeast Greenland.
DIPLOSCHISTES SCRUPOSUS (Schreb.) Norman. 1. On charnokitic rock; ap.; rare.
EPHEBE HISPIDULA (Ach.) Horw. 1. On charnokitic rocks; st. New to Southeast Greenland.
EPILICHEN SCABROSUS (Ach.) Clem. 2. On *Baeomyces rufus* and autonomous; ap. New to Southeast Greenland.
EUOPSIS PULVINATA (Schaer.) Vain. 1, 2. On moist charnokitic rocks and siliceous gravel, together with, e.g., *Lecanora chloroleprosa* and *Spilonema revertens*; st. New to Ammassalik Ø.
FLAVOCETRARIA NIVALIS (L.) Kärnefelt & A. Thell. 2. On soil; st.; common.
FRUTIDELLA CAESIOATRA (Schaer.) Kalb. 1. On mosses; ap. New to Ammassalik Ø.
FUSCOPANNARIA PRAETERMISSA (Nyl.) P. M. Jørg. 1. On soil and charnikitic gravel, together with *Candelariella terrigena*; st.
JAPEWIA TORNOËNSIS (Nyl.) Tønsberg. 1. On mosses and dead twigs of *Juniperus communis*, together with, e.g., *Buellia papillata*, *Lecanora fuscescens* and *Lecidea antiloga*; ap. New to Ammassalik Ø.
KOERBERIELLA WIMMERIANA (Körb.) Stein. 1. On charnokitic rocks; st. The specimens have more or less scattered isidia. New to East Greenland.
LECANORA ARGOPHOLIS (Ach.) Ach. 1. On charnokitic rock; ap. New To Ammassalik Ø.
L. ATROSULPHUREA (Wahlenb.) Ach. 1. On charnokitic rock; ap.
L. BOLIGERA (Norman ex Th. Fr.) Hedl. 1. On dead twigs of *Juniperus communis*; ap.
L. CENISIA Ach. 1. On charnokitic rocks; ap.
L. CHLOROLEPROSA (Vain.) H. Magn. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Euopsis pulvinata*, *Pilophorus dovrensis*, *Spilonema revertens* and *Vestergrenopsis elaeina*; ap.; common.
L. CONTRACTULA Nyl. 1. On charnokitic rocks, together with *Caloplaca alcarum* and *Candelariella vitellina*; ap.
L. FUSCESCENS (Sommerf.) Nyl. 1. On dead twigs of *Salix glauca*; ap. New to Southeast Greenland.
L. INTRICATA (Ach.) Ach. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Lecanora polytropa*, *Melanelia disjuncta* and *Xanthoria elegans*; ap.; common.
L. LEPTACINA Sommerf. 1. On mosses; ap. New to Ammassalik Ø.
L. LEUCOCOCCA Sommerf. 1, 2. On different siliceous rocks; ap. New to Ammassalik Ø.
L. POLYTROPA (Ehrh. ex Hoffm.) Rabenh. 1, 2. On rocks composed of charnokite and other types of siliceous rocks; ap.; common.
LECIDEA ANTILOGA Stirt. 1. On dead twigs of *Juniperus communis*; ap. New to East Greenland.
L. ATROBRUNNEA (Ramond ex Lam. & DC.) Schaer. 1, 2. On bird stones composed of charnokite and other types of siliceous rocks, together with, e.g., *Lecanora polytropa*; ap.
L. ATROMARGINATA H. Magn. 1. On charnokitic rocks, together with, e.g., *Rhizocarpon geminatum*; ap.
L. AURICULATA Th. Fr. 1, 2. On charnokitic and gneissic rocks; ap. New to Ammassalik Ø.
L. LAPICIDA (Ach.) Ach. var. LAPICIDA 1, 2. On siliceous rocks partly covered by a thin layer of limonite; ap.
L. LAPICIDA (Ach.) Ach. var. PANTHERINA Ach. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Lecanora intricata*, *Orphniospora moriopsis* and *Rhizocarpon inarense*; ap.

L. LEUCOTHALLINA Arnold. 1. On charnokitic and gneissic rocks, together with, e.g., *Ephebe hispidula* and *Rhizocarpon badioatrum*; ap. New to Southeast Greenland.

L. SILACEA Ach. 1. On charnokitic rocks covered by a distinct layer of limonite, together with, e.g., *Acarospora smaragdula* and *Tremolecia atrata*; ap.

L. TESSELLATA Flörke. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Buellia aethalea*; ap. New to Southeast Greenland.

LECIDOMA DEMISSUM (Rutstr.) Gotth. Schneid. & Hertel. 1, 2. On soil, often in snow-patches; ap.; locally abundant.

LEPRARIA NEGLECTA (Nyl.) Lettau. 1, 2. On soil. Thallus contains alectorialic acid and atranorin (HPTLC).

LEPROCAULON SUBALBICANS (I. M. Lamb) I. M. Lamb & A. M. Ward. 1. On mosses. The specimens presumably belong to strain IV (Thomson, 1984) with squamatic acid and baeomycesic acid (HPTLC). However, atranorin was not found. New to Southeast Greenland.

LEPTOGIUM SATURNINUM (Dicks.) Nyl. 1. On charnokitic gravel; st.; rare. New to Southeast Greenland. Previously collected by N. Hartz at Tågefjord in Central East Greenland (herb. C).

LOPADIUM CORALLOIDEUM (Nyl.) Lynge. 1. On mosses; ap. New to Ammassalik Ø.

L. PEZIZOIDEUM (Ach.) Körb. 1. On mosses and plant remains; ap. New to Southeast Greenland.

MASSALONGIA CARNOSA (Dicks.) Körb. 1. On mosses; st. New to Ammassalik Ø.

MELANELIA COMMIXTA (Nyl.) A.Thell. 2. On gneissic gravel; ap.; rare.

M. DISJUNCTA (Erichsen) Essl. 1. On charnokitic and gneissic rocks, together with, e.g., *Lecanora intricata*, *Pseudephebe minuscula* and *Xanthoria elegans*; st.

M. HEPATIZON (Ach.) A.Thell. 1. On charnokitic rocks; st.

MICAREA INCRASSATA Hedl. 2. On clayey soil; ap. New to Ammassalik Ø. A rare lichen in East Greenland (Thomson, 1997).

MIRIQUIDICA ATROFULVA (Sommerf.) A. J. Schwab & Rambold. 1. On rocks composed of charnokite and other siliceous rocks with high contents of iron, together with, e.g., *Acarospora smaragdula*, *Porpidia melinodes*, *Tremolecia atrata* and *Umbilicaria torrefacta*; st.

M. GAROVAGLII (Schaer.) Hertel & Rambold. 1. On charnokitic rocks covered by a thin layer of limonite, together with *Acarospora sinopica*, *Lecidea silacea* and *Pseudephebe minuscula*; ap. New to Southeast Greenland.

M. LEUCOPHAEA (Flörke ex Rabenh.) Hertel & Rambold. 1, 2. On charnokitic and gneissic rocks, together with *Tremolecia atrata*; ap. New to Ammassalik Ø.

MYCOBILIMBIA LOBULATA (Sommerf.) Hafellner. 2. On mineral soil; ap. New to Southeast Greenland.

MYCOBLASTUS ALPINUS (Fr.) Th. Fr. ex Hellb. 1. On plant remains; ap. New to East Greenland.

NEPHROMA ARCTICUM (L.) Torss. 1. On soil; st.; rare.

N. PARILE (Ach.) Ach. 1. Among mosses and on twigs of *Juniperus communis*; st. New to Ammassalik Ø.

OCHROLECHIA FRIGIDA (Sw.) Lynge. 1, 2. On mosses, soil and plant remains; ap.; common. LGE 846.

O. GRIMMIAE Lynge. 1. On *Racomitrium lanuginosum*, together with, e.g., *Sphaerophorus globosus*; ap.

O. LAPUËNSIS (Räsänen) Räsänen. 2. On plant remains; ap. New to Ammassalik Ø.

OPHIOPARMA VENTOSA (L.) Norman. 1, 2. On charnokitic and gneissic rocks with or without a thin layer of limonite; ap.

ORPHNIOSPORA MORIOPSIS (A. Massal.) D. Hawksw. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Allantoparmelia alpicola*, *Rhizocarpon jemtlandicum* and *Umbilicaria virginis*; ap.; common.

PANNARIA HOOKERI (Borrer ex Sm.) Nyl. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Phylliscum demangeonii*, *Physcia dubia* and *Placopsis gelida*; rarely on mosses; ap.

P. PEZIZOIDES (Weber) Trevis. 1, 2. On soil and mosses; ap.

PARMELIA SAXATILIS (L.) Ach. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Pseudephebe minuscula* and *Sphaerophorus globosus*; rarely on twigs of *Juniperus communis*; ap.; common. LGE 847.

P. SULCATA Taylor. 1. On charnokitic rocks manured by birds; st.

PELTIGERA CANINA (L.) Willd. 2. Among mosses on soil; st.

P. DIDACTYLA (With.) J. R. Laundon. 2. Among mosses on soil; st.

P. LEPIDOPHORA (Nyl. ex Vain.) Bitter. 1. On soil; st.

P. MALACEA (Ach.) Funck. 2. Among mosses on soil; st.

P. RUFESCENS (Weiss) Humb. 2. On plant remains and among mosses on soil; st.

P. SCABROSA Th. Fr. 2. On soil and mosses on soil; ap.

PERTUSARIA CORIACEA (Th. Fr.) Th. Fr. 1. On plant remains; ap.

P. DACTYLINA (Ach.) Nyl. 1. On soil; ap.

P. GEMINIPARA (Th. Fr.) C. Knight ex Brodo. 2. On *Racomitrium lanuginosum*; st.

P. OCULATA (Dicks.) Th. Fr. 1, 2. On soil and mosses; ap.; common.

PHAEOPHYSCIA SCIASTRA (Ach.) Moberg. 1. On charnokitic birdstone, together with *Placynthium asperellum* and *Rhizocarpon geminatum*; st.

PHYLLISCUM DEMANGEONII (Moug. & Mont.) Nyl. 1. On charnokitic and gneissic rocks, together with, e.g., *Lecanora chloroleprosa*, *Pannaria hookeri* and *Placynthium asperellum*; ap.

PHYSCIA CAESIA (Hoffm.) Fürnr. 2. On gneissic rock; st.

P. DUBIA (Hoffm.) Lettau. 1, 2. On charnokitic and gneissic rocks manured by birds, together with *Xanthoria borealis*; st.

P. PHAEA (Tuck.) J. W. Thomson. 1. On charnokitic rocks; ap. New to Ammassalik Ø. Previously collected at Dronning Marias Dal in Skjoldungen (Moberg & E. S. Hansen, 1986).

PHYSCONIA MUSCIGENA (Ach.) Poelt. 1. On soil; st.

PILOPHORUS DOVRENSIS (Nyl.) Timdal, Hertel & Rambold. 1. On soil, charnokitic gravel and rocks composed of charnokite; ap. There are two previous reports of this species from East Greenland (Dahl, Lynge & Scholander, 1937; Lynge, 1940). New to Ammassalik Ø.

PLACOPSIS GELIDA (L.) Linds. 1, 2. Usually solitarily occurring on often strongly weathered charnokitic and gneissic rocks; st.; common.

PLACYNTHIUM ASPERELLUM (Ach.) Trevis. 1. On charnokitic rocks; ap.

POLYBLASTIA CUPULARIS A. Massal. 1. On charnokitic rocks; pe. New to Southeast Greenland.

POLYCHIDIUM MUSCICOLA (Sw.) Gray. 1. On mosses; ap. New to Southeast Greenland.

POLYSPORINA SIMPLEX (Davies) Vězda. 1. On charnokitic rocks, together with, e.g., *Lecanora intricata* and *Lecidea lapicida* var. *pantherina*; ap. New to Southeast Greenland.

POROCYPHUS COCCODES (Flot.) Körb. 1. On plant remains; ap. New to Greenland. Previously reported from the British Islands, Europe, Algeria and North America (Purvis et al., 1992).

PORPIDIA FLAVICUNDA (Ach.) Gowan. 1. On charnokitic rocks with a thin layer of limonite; ap. New to Southeast Greenland.

P. FLAVOCOERULESCENS (Hornem.) Hertel & A. J. Schwab. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Lecidea lapicida* var. *lapicida*, *Tremolecia atrata* and *Umbilicaria virginis*; ap.; common.

P. MACROCARPA (DC.) Hertel & A. J. Schwab. 1. On gneissic rocks; ap. New to Ammassalik Ø.

P. MELINODES (Körb.) Gowan & Ahti. 1, 2. On charnokitic and gneissic rocks with a thin layer of limonite, together with, e.g., *Miriquidica atrofulva* and *Tremolecia atrata*; st. LGE 291

P. THOMSONII Gowan. 1. On charnokitic rocks; ap. New to Greenland. The species is widely distributed in North America (Thomson, 1997).

PROTOPARMELIA BADIA (Hoffm.) Hafellner. 1, 2. On rocks manured by birds composed of charnokite and gneiss, together with, e.g., *Lecanora polytropa*, *L. intricata* and *Rhizocarpon geographicum*; ap.

PSEUDEPHEBE MINUSCULA (Nyl. ex Arnold) Brodo & Hawksw. 1, 2. On charnokitic and gneissic rocks, including rocks manured by birds and rocks rich in iron; st.; common. LGE 848.

P. PUBESCENS (L.) M. Choisy. 1, 2. On charnokitic and gneissic rocks; st.

PSORA RUBIFORMIS (Ach.) Hook. 1. On soil; rare.

PSOROMA HYPNORUM (Vahl) Gray. 1, 2. On soil and mosses; ap.; common. LGE 845.

PYRENOPSIS FURFUREA (Nyl.) Leight. 1. On charnokitic rocks; ap. New to East Greenland.

RHIZOCARPON BADIOATRUM (Flörke ex Spreng.) Th. Fr. 1, 2. On charnokitic and gneissic rocks, together with, e.g., *Aspicilia aquatica*, *Ephebe hispidula* and *Koerberiella wimmeriana*; ap.

R. BOLANDERI (Tuck.) Herre. 1. On charnokitic rocks; ap. New to Southeast Greenland.

R. COPELANDII (Körb.) Fr. 1, 2. On charnokitic and gneissic rocks; ap.

R. DISPORUM (Nägeli ex Hepp) Müll. Arg. 1. On charnokitic rock; ap.

R. GEMINATUM Körb. 1. On charnokitic rocks, together with, e.g., *Physcia caesia*, *Xanthoria elegans* and *X. sorediata*; ap.; common. New to Ammassalik Ø.

R. GEOGRAPHICUM (L.) DC. 1, 2. On charnokitic and gneissic rocks including rocks with a distinct limonite cover; ap.; common.

R. GRANDE (Flörke) Arnold. 1, 2. On gneissic rocks, together with, e.g., *Umbilicaria deusta* and *U. torrefacta*; ap. New to Southeast Greenland.

R. INARENSE (Vain.) Vain. 1, 2. On charnokitic and gneissic rocks including rocks with limonite crusts; ap. New to Ammassalik Ø.

R. JEMTLANDICUM (Malme) Malme. 1, 2. On charnokitic and gneissic rocks; ap. New to Ammassalik Ø.

R. NORVEGICUM Räsänen. 1. On *Tremolecia atrata* on rocks rich in iron; ap.; rare. New to Ammassalik Ø.

R. RITTOKENSE (Hellb.) Th. Fr. 1, 2. On charnokitic and gneissic rocks; ap.

R. SUPERFICIALE (Schaer.) Vain. 2. On gneissic rocks; ap. New to Ammassalik Ø.

RHIZOPLACA MELANOPHTHALMA (DC.) Leuckert & Poelt. 1. On gneissic birdstone, together with *Lecanora intricata*; ap.; rare.

RIMULARIA FURVELLA (Nyl. ex Mudd) Hertel & Rambold. 1. On *Aspicilia* sp. on charnokitic rock; ap. New to Southeast Greenland.

R. IMPAVIDA (Th. Fr.) Hertel & Rambold. 1. On charnokitic rock; ap. New to East Greenland.

RINODINA TURFACEA (Wahlenb.) Körb. 1. On plant remains and twig of *Juniperus communis*; ap. New to Ammassalik Ø.

SOLORINA CROCEA (L.) Ach. 1, 2. On soil, together with, e.g., *Cladonia ecmocyna*; ap.; common.

SPHAEROPHORUS FRAGILIS (L.) Pers. 2. On gneissic rock, together with, e.g., *Parmelia saxatilis*; st.

S. GLOBOSUS (Huds.) Vain. 1, 2. Among mosses on soil; st. LGE 293.

SPILONEMA REVERTENS Nyl. 1. On moist charnokitic rock; ap. New to East Greenland. The species is often infested by *Psorula rufonigra* (Brodo, S. D. Sharnoff & S. Sharnoff, 2001). *P. rufonigra* has not been reported from Ammassalik Ø so far.

SPORASTATIA TESTUDINEA (Ach.) A. Massal. 1, 2. On gneissic rocks, together with, e.g., *Calvitimela armeniaca*; ap. New to Ammassalik Ø.

STAUROTHELE AREOLATA (Ach.) Lettau. 1. On charnokitic rocks; ap. New to Southeast Greenland.

STEREOCAULON ALPINUM Laurer. 2. On gravelly soil; ap.

S. ARENARIUM (Savicz) I. M. Lamb. 1, 2. On gravelly soil originating from charnokite and gneiss; st. Thallus contains atranorin and porphyrilic acid (HPTLC). New to Ammassalik Ø.

S. BOTRYOSUM Ach. 1. On charnokitic rocks st.

S. GLAREOSUM (Savicz) H. Magn. 1, 2. On charnokitic gravel and soil; ap. New to Southeast Greenland.

S. INCRUSTATUM Flörke. 1. On gravelly soil; st. New to Southeast Greenland.

S. PASCHALE (L.) Hoffm. 2. On soil; st.

S. VESUVIANUM Pers. 1, 2. On siliceous rocks and gravel; st.

THAMNOLIA VERMICULARIS (Sw.) Schaer. var. SUBULIFORMIS (Ehrh.) Schaer. 1, 2. On soil and mosses.

TRAPELIOPSIS GRANULOSA (Hoffm.) Lumbsch. 1, 2. On soil rich in humus; st. New to Ammassalik Ø.

TREMOLECIA ATRATA (Ach.) Hertel. 1, 2. On rocks composed of charnokite and other siliceous rocks with high contents of iron; ap.; common. LGE 290.

UMBILICARIA ARCTICA (Ach.) Nyl. 1, 2. On charnokitic and gneissic rocks manured by birds, together with, e.g., *Parmelia saxatilis*, *Physcia dubia* and *Xanthoria borealis*; ap.; locally abundant.

U. DEUSTA (L.) Baumg. 1. On charnokitic and gneissic rocks, together with, e.g., *Rhizocarpon grande*; st.

U. HYPERBOREA (Ach.) Hoffm. 1, 2. On charnokitic and gneissic rocks; ap.; common.

U. PROBOSCIDEA (L.) Schrad. 1. On charnokitic rocks; ap.

U. TORREFACTA (Lightf.) Schrad. 1, 2. On charnokitic and other types of siliceous rocks, together with, e.g., *Phylliscum demangeonii* and *Tremolecia atrata*; ap.; common.

U. VIRGINIS Schaer. 1, 2. On charnokitic and gneissic rocks; ap.; common.

VERRUCARIA CEUTHOCARPA Wahlenb. 2. On gneissic seashore rocks; per. New to East Greenland.

V. MAURA Wahlenb. 1. On charnokitic seashore rocks; per. New to Ammassalik Ø.

V. MUCOSA Wahlenb. 1. On charnokitic seashore rocks; per. New to East Greenland.

V. NIGRESCENS Pers. 1. On charnokitic rock; per. New to Southeast Greenland.

VESTERGRENOPSIS ELAEINA (Wahlenb.) Gyeln. 1. On charnokitic rock, together with, e.g., *Lecanora chloroleprosa*; ap.

V. ISIDIATA (Degel.) E. Dahl. 1. On charnokitic rocks and wood; ap. New to Southeast Greenland.

XANTHORIA BOREALIS R. Sant. & Poelt. 1, 2. On charnokitic and gneissic rocks manured by birds, together with, e.g., *Amandinea cacuminium, Physcia dubia* and *Umbilicaria arctica*; ap.

X. ELEGANS (Link) Th. Fr. 1, 2. On charnokitic and gneissic rocks manured by birds, together with, e.g., *Physcia caesia* and *Rhizocarpon geminatum*; ap.; common.

X. SOREDIATA (Vain.) Poelt. 1. On basal part of charnokitic birdstone, together with *Rhizocarpon geminatum*; st.; rare.

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REFERENCES

Bridgwater, D. & Gormsen, K. 1968. Precambrium rocks of the Angmagssalik District, East Greenland. *Grønlands geol. Unders. Rapp.* 15: 61–71.

Brodo, I., Sharnoff, S. D. & Sharnoff, S. 2001. *Lichens of North America*. Yale University Press. New Haven and London. 795 pp.

Dahl, E., Lynge, B. & Scholander, P. F. 1937. Lichens from Southeast Greenland. *Skrifter om Svalbard og Ishavet* 70: 1–77.

Daniels, F. J. A. 1968. Lichens collected during a Dutch botanical East Greenland expedition to Angmagssalik area in 1966. *Acta Bot. Neerl.* 17 (5): 345–348.

Daniels, F. J. A. 1975. Vegetation of the Angmagssalik District, Southeast Greenland. *Meddel. Grønland* 198 (3): 1–32.

Daniels, F. J. A. 1982. Vegetation of the Angmagssalik District, Southeast Greenland. *Meddel. Grønland Biosci.* 10: 1–78.

Daniels, F. J. A. & Ferwerda, H. F. 1972. Three interesting lichen finds from Southeast Greenland. *Acta Bot. Neerl.* 21 (2): 166–168.

Daniels, F. J. A. , Hansen, E. S. & Sipman, H. J. M. 1985. New records of terricolous microlichens from Southeast Greenland. *Acta Bot. Neerl.* 34 (1): 49–58.

Hansen, E. S. 1978. Notes on occurence and distribution of lichens in Southeast Greenland. *Meddel. Grønland* 204 (4): 1–71.

Hansen, E. S. 1986. Lichener som indikatorer for tungmetaller i Grønland. *Forskning/Tusaat* 1/86: 2–8.

Hansen, E. S. 1995: *Greenland Lichens*. Atuagkat & Rhodos in cooperation with Danish Polar Center, Copenhagen, 124 pp.

Hansen, E. S. 1999. Epilithic lichens on iron- and copper-containing crusts at Qeqertarssuaq, Central West Greenland. *Graphis Scripta* 10: 7–12.

Hansen, E. S. 2001. Lichen-Rich Soil Crusts of Arctic Greenland. *Ecological Studies* 150:. 57–65.

Hansen, E. S., Poelt, J. & Søchting, U. 1987. Die Flechtengattung *Caloplaca* in Grønland. *Meddel. Grønland Biosci.* 25: 1–52.

Lynge, B. 1937. Lichens from West Greenland, collected chiefly by Th. M. Fries. – *Meddel. Grønland* 118(8): 1–225.

Magnusson, A. H. 1952. Lichens from Torne Lappmark. *Ark. Bot.*, Ser. 2, 2: 1–249.

Mayrhofer, H. & Sheard, J. W. 2002. *Amandinea cacuminium*: a new combination (Physciaceae, lichenized Ascomycetes). *Mycotaxon* 82: 437–441.

Moberg, R. & Hansen, E. S. 1986. The lichen genus *Physcia* and allied genera in Greenland. *Meddel. Grønland Biosci.* 22: 1–32.

Purvis, O. W., Coppins, B. J., Hawksworth, D. L., James, P. W. & Moore, D. M. (eds) 1992. *The lichen flora of Great Britain and Ireland*. Natural History Museum Publications, London. 710 pp.

Purvis, O. W. & Halls, C. 1996. A review of lichens in metal-enriched environments. *Lichenologist* 28: 571–601.

Santesson, R. 1993. *The lichens and lichenicolous fungi of Sweden and Norway*. SBT-förlaget, Lund. 240 pp.

Thomson, J. W. 1984. *American Arctic Lichens. I. The Macrolichens*. Colombia University Press. New York. 504 pp.

Thomson, J. W. 1997. *American Arctic Lichens. II. The Microlichens*. The University of Wisconsin Press. Wisconsin. 675 pp.

Wright, A. E., Tarney, J., Palmer, K. F., Moorlock, B. S. P. & Skinner, A. C. 1973. The Geology of the Angmagssalik Area, East Greenland and possible relationships with the Lewisian of Scotland. – In: Park, R. G. & Tarney, J. (eds). *The Early Precambrian of Scotland and related rocks of Greenland*. University of Keele, New Castle: 157–177.

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A few out of many – interesting inoperculate, lignicolous discomycetes from Norway

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Abstract: Seven species of inoperculate discomycetes growing on decaying wood are critically studied. Their taxonomy, variability and ecology are discussed.

Kokkuvõte: A. Raitviir ja S. Huhtinen. Mõned paljudest – huvitavaid inoperkulaatseid puidul kasvavaid liudseeni Norrast.

Kriitiliselt uuriti 7 kõdunenud puidul kasvavat inoperkulaatse liudseene liiki. Käsitletakse nende taksonoomiat, varieeruvust ja ökoloogiat.

INTRODUCTION

The material has been collected in a large-scaled biodiversity project on dead wood and the associated species community of fungi and beetles in SE Norway (see Stokland (2001) for a methodological description). The first author was sent more than 2000 collections of Ascomycetes collected during field works of this project for identification. This ample material comprised a small number of interesting species. A new species *Incrupila lignicola* Raitv. has been described (Raitviir, 1997). There are seven more species worth of detciled discussion which is provided in the present paper.

Ciliolarina laetifica Huhtinen, *C. neglecta* Huhtinen, *Gorgoniceps hypothallosa* Svrcek, *Ombrophila lilacina* (Wulfen: Fr.) Rehm, *Phaeohelotium trabinellum* (P. Karst.) Dennis and *Discocainia treleasei* (Sacc.) J. Reid & A. Funk are discussed in detail, and a collection of *Hyaloscypha aureliella* (Nyl.) Huhtinen growing on deciduous wood is described and illustrated.

MATERIALS & METHODS

The dry material was mounted in the following mountants: MLZ (Melzer's reagent), CB (Cotton blue in lactic acid, glycerine & water), CR (ammoniacal Congo red), CRB (Cresyl blue in water), KOH (10 % (SH) or 3% (AR) potassium hydroxide in water), LUG (1 % IKI) and examined in Olympus BX40, using an UPlanFl100x lens, and an AcuZoom zooming module (Optem International) with which the camera lucida drawings were made to the scale of 1:2500 (SH) and Nikon Labophot-2 (AR) microscopes. All observations and measurements are based on dried material. Kornerup & Wanscher (1967) has been followed for the colour names and in some cases Cailleux (1981) colour codes are also given. Bold x (**x**) is used to indicate ascus and spore length mean values. The specimens are preserved in **O**, if duplicates are kept in **TUR** and **TAA**, it is indicated.

RESULTS

The first author examined more than 2000 collections of Ascomycetes collected during field works of this project and identified 102 species and 4 varieties of inoperculate Discomycetes**.** Six species and a set of atypical specimens of *Ciliolarina neglecta* treated in the present paper were identified by the second author and so the total number of inoperculate Discomycetes becomes 108.

To evaluate the frequency of included species in Norwegian forests against the frequency of the common species of Helotiales we present the frequency data of 20 most common Helotiales indicating the number of localities and number of individual logs bearing the species (Table 1). In total 4145 logs were sampled from 159 different localities (Stokland, pers. comm.).

Table 1. Frequency of the 20 most common species of lignicolous Helotiales in Norway

Species	localities	logs
Hyaloscypha aureliella	79	183
Orbilia delicatula	76	144
Mollisia cinerea	69	151
Ascocoryne cylichnium	54	101
Phaeohelotium trabinellum	49	95
Bisporella citrina	42	111
Ascocoryne sarcoides	38	74
Orbilia inflatula	35	57
Ciliolarina neglecta	30	82
Mollisia macrosperma	28	37
Tapesia fusca	24	43
Tapesia livido-fusca	23	39
Lachnellula suecica	17	38
Gorgoniceps hypothallosa	17	24
Mollisia ligni	15	17
Propolis versicolor	14	18
Mollisia ventosa	13	30
Mollisia caespitica	12	12
Lachnum virgineum	11	15
Chlorencoelia versiformis	10	14

Ciliolarina laetifica Huhtinen

Figs. 1–3

This species was described on the basis of one specimen from Canada (Huhtinen, 1993) and is reported now for the first time from Europe. It was originally distinguished from *C. neglecta* Huhtinen by its larger apothecia, MLZ– asci and larger, more prominently guttulate spores. These two new collections widen the variability. The apothecia are as clearly stipitate as in *C. neglecta*. Both new collections show MLZ+ asci. The ascus size difference does hold: they are clearly larger than those of *C. neglecta*. The asci measure 30–42 × 5.5–6.3 µm (**x**= 39 × 5.8 µm, n= 8) in MLZ. Likewise, the originally reported difference in spore size is confirmed. The spore size of the new material is: 4.8–6.7 × 2.0–2.6 µm (**x**= 5.7 × 2.3 µm), Q= 2.2–2.9, **Q**= 2.6 (n= 20) in CR. Hence, it appears that the discontinuity found out in one of the Canadian specimen holds in Europe too, even though the ecology is exactly similar.

Specimens examined: Oppland, Sel, F23, *Pinus sylvestris*, 25 IX 1996, Stokland 7899. – Tynset, Gammeldalen, *Picea abies*, 15 X 1997, Stokland 25479 (TUR).

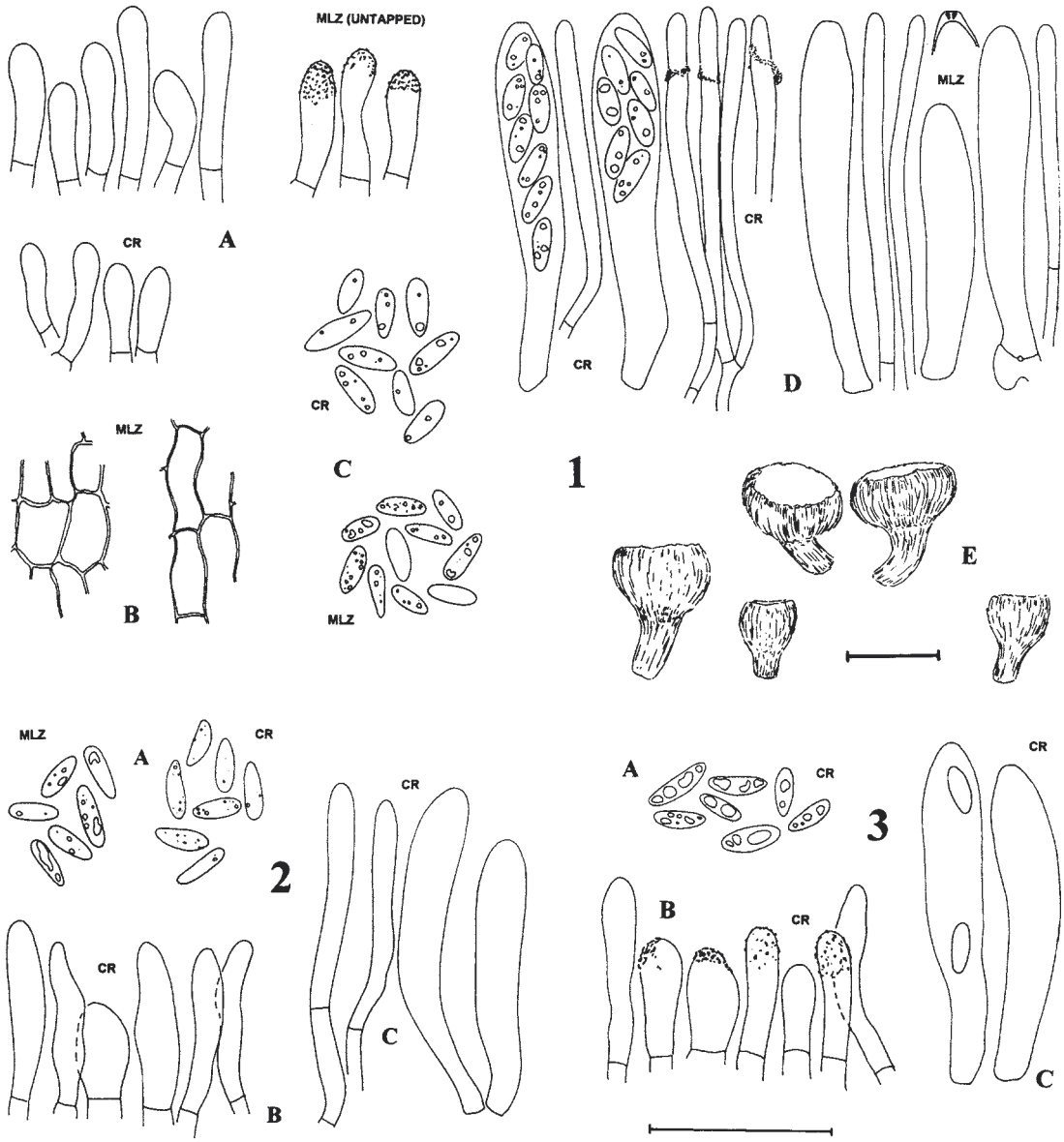
Ciliolarina neglecta Huhtinen

Figs. 4–7

This species was described on the basis of eight specimens, most of which originated from the Canadian timberline. Only one of the paratypes was from Finland. All specimens were collected from coniferous substrate, ranging from naked wood to cortex and cones (Huhtinen, 1993). Likewise, the present new specimens from Norway occur on coniferous substrate (*Pinus* and *Picea*). They show the typical hair characteristics of the genus: gently mounted hairs in MLZ show the clear apical roughness, while those which are tapped are typically totally smooth. This loose roughness was shown to be characteristic to all known species included in the genus (Huhtinen, 1993).

Most of the collections were fully typical for the species but there were about ten specimen which showed some deviant characters and were not at the first glance recognizable as *C. neglecta*. With this new material, the original diagnosis needs to some extent be emended. The ectal excipulum is firm-walled and strictly prismatic only for one cell layer. Beneath this is a thin-walled excipulum composed of large, elongated, clearly enlarged cells, which are loosely bound together (Fig. 4F). Hence, in CR, they separate readily and characterize the mounts to masking the textura prismatica depicted in the original diagnosis. In one population up to 2/3 of the stipe was black and this seems to represent the maximum for this species. There is a great amount of variability in this character, because in most populations the stipes are totally light-coloured or blackish only at the extreme base. The outermost excipular layer on stipe is composed of elongated, regular textura prismatica.

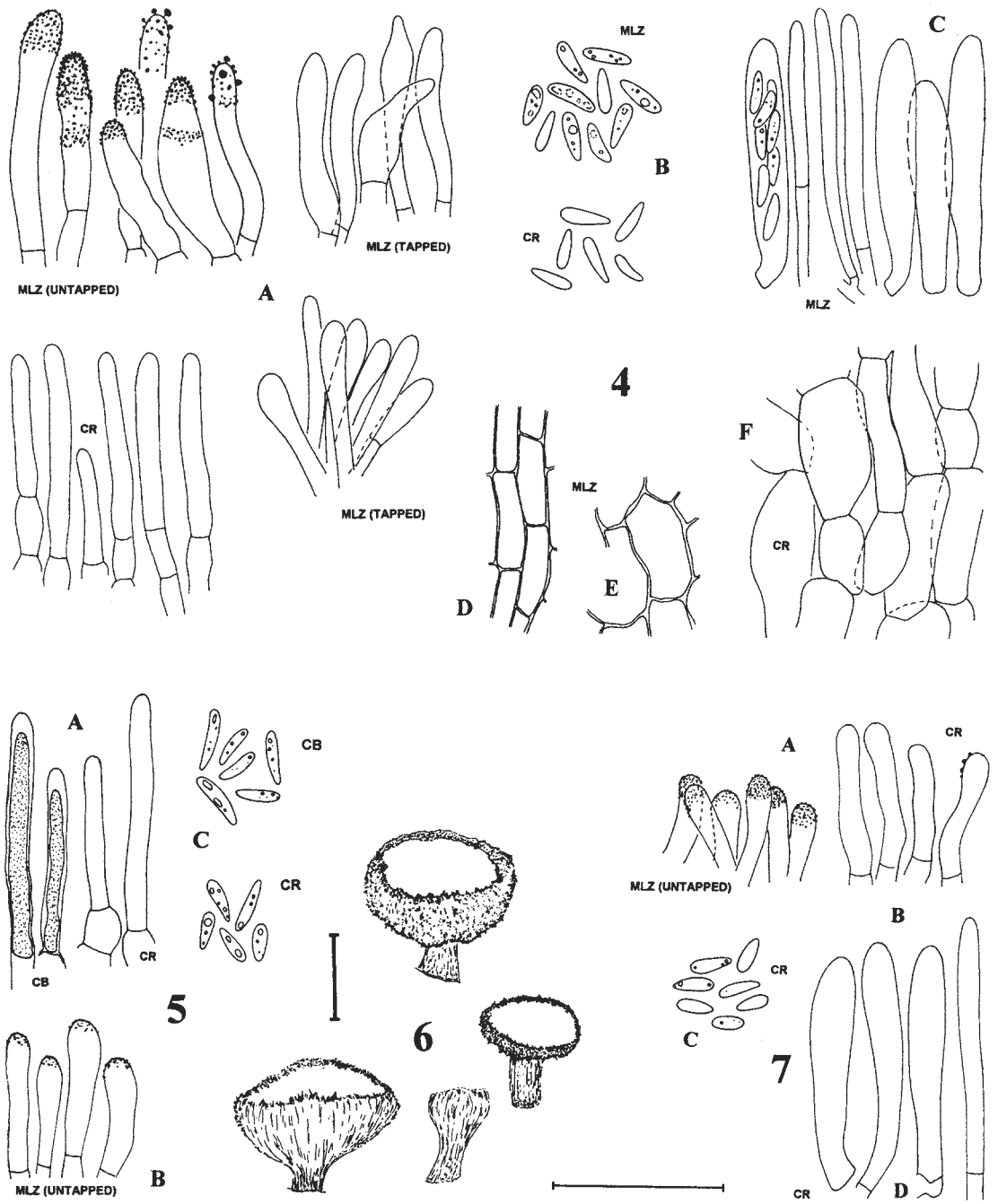
Hairs show large variability: from the short and clavate ones more typical of the Canadian material to cylindrical or cylindrical-clavate. In some populations all marginal hairs are cylindrical and clavate hairs are hard to observe. In almost all populations they can be found, however. Populations with cylindrical hairs only can easily be taken as species of the genus *Psilocistella* Svrcek. The apical, loose roughness and coniferous substrate are of help in such cases. The scantiness of present collections may also explain the scantiness of clavate hairs, because often only one apothecium could be stud-



Figs 1–3. *Ciliolarina laetifica*, specimens *Stokland* 25479 (1), 7899 (2), holotype (3). – 1a: Marginal hairs. 1b: Outermost layer of medial flank excipulum. 1c: Ascospores. 1d: Asci and paraphyses. 1e: Dry apothecia. – 2a: Ascospores. 2b: Marginal hairs. 2c: Asci and paraphyses. – 3a: Ascospores. 3b: Marginal hairs. 3c: Asci. – Scale 20 µm, for apothecia 100 µm.

ied. Ample collections will be needed to indicate variability within populations in this respect.

Hair roughness is mostly granular. Apparently part of hair vesture may deform in MLZ, because also occasional swollen or even stalked globules are seen amongst these granules (Fig. 4A). In CB and CR hairs are smooth. Only in one population few scattered warts were seen on some hairs in CR (7B). In a CB mount hairs may look as if firm-walled, but this effect is due



Figs. 4–7. *Ciliolarina neglecta*, specimens *Stokland* 8310 (4, 6), 8159 (5), 10806 (7). – 4a: Marginal hairs. 4b: Ascospores. 4c: Asci and paraphyses. 4d: Outermost layer of stipe excipulum. 4e: Outermost layer of medial flank excipulum. 4f: Inner excipulum from medial flanks. – 5a: Marginal hairs. 5b: Marginal hairs from another apothecium. 5c: Ascospores. – 6: Dry apothecia. – 7a: Marginal hairs. 7b: Marginal hairs from another apothecium. 7c: Ascospores. 7d: Asci and paraphysis. – Scale 20 µm, for apothecia 100 µm.

to retracted plasma (5A). Asci have a blue apical pore in LUG.

The small and inconspicuous *C. neglecta* turned out to be a common and abundant xylotrophic discomycete in Norwegian forests. It was found on 82 logs in 30 localities and was, in fact, the second species in abundance on softwood after *Hyaloscypha aureliella*. It prefers clearly pine wood as 67 collections (82%) are from *Pinus sylvestris* and 15 collections (18%) from *Picea abies*.

Specimens examined: Oppland, Sel, F23, *Pinus sylvestris*, 25 IX 1996, Stokland 7868, 7908 & 7923. – Oppland, Sel, Havringen, *Pinus sylvestris*, 25 IX 1996, Stokland 7991. – Oppland, Vågå, Salliseter, F53, *Pinus sylvetris*, 26 IX 1996, Stokland 8159, 8219, 8228, 8300, 8302 & 8310. – Oppland, Gran Gullenhaug, *Picea abies*, 30 IX 1996, Stokland 8493, 8508, 8598 & 8618. – Oppland, Nord-Fron, Stråla, F63, *Pinus sylvestris*, 9 × 1996, Stokland 10627, 10662, 10712, 10752, 10785, 10806, 10809 & 10832. – Oppland, Nord-Fron, F43, *Pinus sylvestris*, 9 X 1996, Stokland 10927, 10946 & 11041. – Telemark, Bable, F41, *Pinus sylvestris*, 4 X 1996, Stokland 9678. – Telemark, Dragendal, F42, *Pinus sylvestris*, 6 X 1996, Sockland 9866, 9887. – Akershus, Sørum, G51, *Picea abies*, 14 X 1996, Stokland 11654. – Nore ug Uvdal, Smådøldalen, *Pinus sylvestris*, 2 IX 1997, Stokland 15666. – Hol, Kjerbuhovda, *Pinus sylvestris*, 3 IX 1997, Stokland 15834, 16019. – Nes, Tronrud, *Pinus sylvestris*, 4 IX 1997, Stokland 16256. – Nes, Storevatn, *Pinus sylvestris*, 5 IX 1997, Stokland 16581 & 16584. – Nes, Ålungruken, Picea abies, 25 IX 1997, 21589. – Nes, Gjuvbekken, *Pinus sylvestris*, 26 IX 1997, Stokland 21873. – Engerdal, Trøan, *Pinus sylvestris*, 17 IX 1997, Stokland 19027, 19032 & 19169. – Ringerike, Flåmurene, *Pinus sylvestris*, 22 IX 1997, Stokland 19027 & 19032. – Rendalen, Fuggdalen 1, *Pinus sylvestris*, 19 IX 1997, Stokland 19169. – Rendalen, Kiva, *Pinus sylvestris*, 14 X 1997, Stokland 25201, 25205, 25214, 25229, 25263, 25268 & 25269. – Rendalen, Kverninga, *Pinus sylvestris*, 16 X 1997, Stokland, 25634, 25646, 25660, 25710, 15720, 25742, 25744 & 25755. – Modum, Dritardalen, *Pinus sylvestris*, 23 IX 1997, Stokland 20334. –Tinn, Flellstul, *Picea abies*, 25 IX 1997, Stokland 21053. – Modum, Kløftefoss, *Pinus sylvestris*, 24 IX 1997, Stokland 20838. – Hurdal, Fjellsjøkampen, Picea abies, 6 X 1997, Stokland 23263, 23353, 23390, 23406. – Frogn, Håøya, *Picea abies*, 8 X 1997, Stokland 23822 & 23931. – Alvdal, Urlia, *Pinus sylvetris*, 14 X 1997, Stokland 25376. – Tynset, Gammeldalen, *Pinus sylvetris*, 15 X 1997, Stokland 25412, 25442, 25446, 25458 & 25521. – Halden, Prestebakke, *Pinus sylvestris*, 21 X 1997, Stokland 26361, 26381, 26467, 26502 & 26692. – Halden, Godabergene, *Pinus sylvestris*, 22 X 1997, Stokland 26727.

Gorgoniceps hypothallosa Svrcek
Fig. 8

Apothecia gregarious, up to 500 µm in diam, cupulate on a stout stipe to narrowly sessile, with or without a cover of hyaline to brown hyphae radiating from the base, sienna to terracota or burnt sienna (flanks Cailleux P59, margin M59), disc plane, concolorous to flanks but lightened by the whitish scurfy surface, margin firm, slightly raised above the hymenium and slightly incurved, smooth, stipe blackish. Apothecia, particularly the excipulum turn tomato red and exude pale orange to yellowish hue when mounted in KOH. *Ectal excipulum* MLZ-, CR-, CB-, of brown textura oblita – textura porrecta, vivid brownish orange to tomato red in 3% KOH, greenish in 10% KOH, walls hyaline, colour localized inside the hyphae, outermost hyphae varying from firm to thick-walled, walls 0.5 to 1.5 µm thick, running parallel to almost parallel to the surface, 3.5–4.5 µm wide on middle flanks, at places terminating with a short clavate, firm-walled cell, 5–6.5 µm wide; hyphae forming inwards textura porrecta, 1.5–3.0 µm wide, walls slightly thickened. *Margin* composed of thick-walled to only slightly firm-walled hyphae ends, terminal cells cylindrical to slightly clavate, walls hyaline, smooth, contents very faintly brownish. *Asci* 90–135 × 8.5–10.0 µm in CR (**x**= 109 × 9.6 µm, n= 10) narrowly clavate, eight-spored, slightly firm-walled, arising from croziers, apex conical, typically with a prominent protuberance at the pore, MLZ+ (faint blue) without KOH -treatment, LUG+ (blue), pore also clearly visible in KOH. *Spores* 22–32 × 2.8–3.6 µm, in CR (**x**= 27.5 × 3.2 µm, n= 20), filiform, usually 3-septate, but occasionally also 4–6-septate, cylindrical to narrowly subfusoid, slightly curved, apices blunt to slightly tapering, multiguttulate, spumose in LUG and hence masking the septa, wall slightly thickened, septa CR-, CB-. *Paraphyses* filiform, 1.3 × 2.5 µm wide, apically similar or slightly wider, simple, more rarely branched in upper part or apices irregular, with hyaline contents or with yellowish brown contents, rarely showing bulbous thickenings in lower parts.

The present material is a perfect match to Svrcek's (1984) original diagnosis and although the type was not checked, our material is undoubtedly conspecific. Svrcek found the type specimen from the underside of spruce cortex.

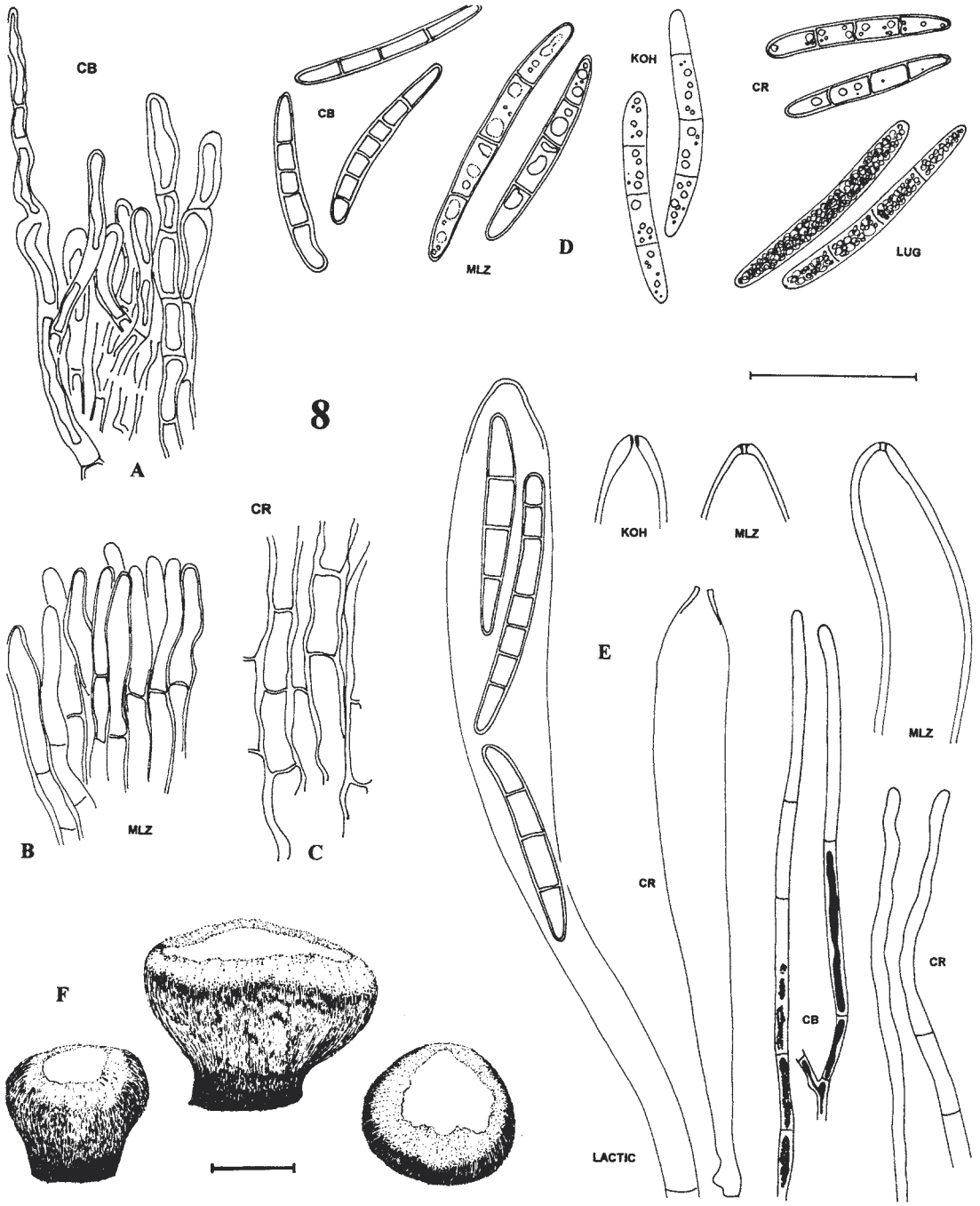


Fig. 8. *Gorgoniceps hypothallosa*, specimens *Stokland* 16255, 21973, 25635, 25678. – 8a: Detail of margin showing the maximal firm-walled appearance. 8b: Detail of margin showing the actual wall thickness. 8c: Excipulum from upper flanks. 8d: Ascospores. 8e: Asci and paraphyses. 8f: Dry apothecia. – Scale 20 µm, for apothecia 100 µm.

He stated the apothecia to occur on blackish, resinous exudations. The occurrence of a brownish hypothallus was stressed as typical of the species. Indeed, in quite many populations a prominent, silvery whitish to brown hypothallus surrounds the apothecial basis. It is most prominent in those populations where apothecia occur on a blackish crust of deteriorating fungi. Only in a couple of populations the apothecia occurred on naked wood, without any obvious connection to other fungi or with only scattered blackish nodules nearby. Such apothecia showed no traces of a hypothallus.

All our specimens were collected on *Pinus* wood, so this is a slight difference from type collection. As the blackish crust of well deteriorated fungi is so typical of this species, that might have been the case also in the type (subresinous exudates?).

There is very little variability between the populations. The most variable characters seem to be the amount of hyphae radiating from the base and the proportion of more than 3-septate spores. Also the ecology is fairly constant. Only in two populations the apothecia grew on naked wood and only small, black nodules of fungal cells were seen close-by. All other populations had apothecia growing on old fungi. These seemed not to be Pyrenomycetes.

To our knowledge, this taxon is only reported from Czech Republic and Norway.

Specimens examined (all on *Pinus sylvestris* wood): Nore and Uvdal, Smådøldalen, 2 IX 1997, Stokland 15655 (TUR). – Nes, Tronrud, 4 IX 1997, Stokland 16255 (TUR). Nes, Gjuvbekken, 26 IX 1997, Stokland 21827 (TUR), 21887 (TAA), 21973 (TUR). – Trysil, Bågåkjølen, 15 IX 1997, Stokland 17335. – Engerdal, Trøan, 17 IX 1997, Stokland 18619 (TAA). – Rendalen, Østvollen, 18 IX 1997, Stokland 18868 (TAA). Rendalen, Fuggdalen, 19 IX 1997, Stokland 19262 (TAA). – Rendalen, Kiva, 14 X, Stokland 25224 (TAA). – Rendalen, Kverninga, 16 X, Stokland 25635, 25678 (TUR), 25697 (TAA), 25709 (TAA). – Ringerike, Flåmyrene, 22 IX 1997, Stokland 19026 (TAA), 19042 (TAA). – Ringerike, Væleren, 23 IX 1997, Stokland 20169 (TAA). – Modum, Dritardalen, 23 IX 1997, Stokland 20363 (TAA, TUR). – Brunlanes, Askedalsåsane, 1 X 1997, Stokland 22947 (TAA). – Råde, Kil, 9 X 1997, Stokland 24281 (TAA). – Halden, Godabergene, 22 X 1997, Stokland 26726 (TAA).

Hyaloscypha aureliella (Nyl.) Huhtinen

Fig. 12

A detailed description of this species is given by Huhtinen (1990). It is widely distributed and collected and it was the most common and abundant helotiaceous fungus on coniferous substrate in the Norwegian material, too. It was collected in 79 localities and on 183 different logs. Surprisingly, one specimen was found growing on decorticated wood of *Betula*. Substrate was verified microscopically and is definitely deciduous wood. The apothecia are in every respect typical for *H. aureliella*. Even the abundant yellow resin and the occasional deep amyloid reactions inside hairs, characterizing coniferous populations, were present (Huhtinen, 1990). To our knowledge this is the first ecologically deviating record of this species amongst the nearly 600 populations studied so far. Surprisingly, when writing this article, a collection was sent for determination from UK (Abernathy Forest Reserve) by Ann Leonard, which turned out to be a typical population of this species. The surprise was its substrate: a skeletonized leaf of *Vaccinium*.

Specimen examined: Norway, Nybu, Nore og Uvdal, *Betula*, 1 IX 1977, Stokland 15363 (TAA, TUR).

Ombrophila lilacina (Wulfen: Fr.) P. Karst.

Fig. 9

Peziza lilacina Wulfen: Fr. Syst. Mycol. 2: 104, 1823. *Coryne lilacina* (Wulfen: Fr.) Boud. Hist. Class, Discom. d'Europe: 98, 1907. *Neobulgaria lilacina* (Wulfen: Fr.) Dennis, Kew Bull. 25: 346, 1971.

Apothecia superficial, solitary or in small clusters, broadly to narrowly sessile, 0.5–2 mm in diameter, saucer-shaped with well-defined raised margins, disc and receptacle pale pink to dull grayish red when dry, gelatinous when fresh or soaked, ceraceous when dry. Ectal excipulum composed of thin-walled, hyaline, non-gelatinous cells at the flanks. Margin composed of non-gelatinous textura porrecta. Medulla composed of gelatinized textura intricata. *Asci* 80–96 × 6–7.5 µm in CR (**x**= 86.4x6.3 µm, n= 10) cylindric-clavate, eight-spored, arising from croziers, apex rounded with a MLZ+ without KOH -treatment pore, LUG+ (blue), pore also clearly visible in KOH. *Spores* 8–12 × 3.5–5 µm, in CR (**x**= 9.8 × 3,8 µm, n= 20), hyaline, asymmetrically subfusoid, aseptate, containing 1 or 2 lipid guttules. Paraphyses filiform, 1.6–2 µm wide, sparsely septate, apically not swollen.

This characteristic species has been treated in the literature quite many times (Karsten,

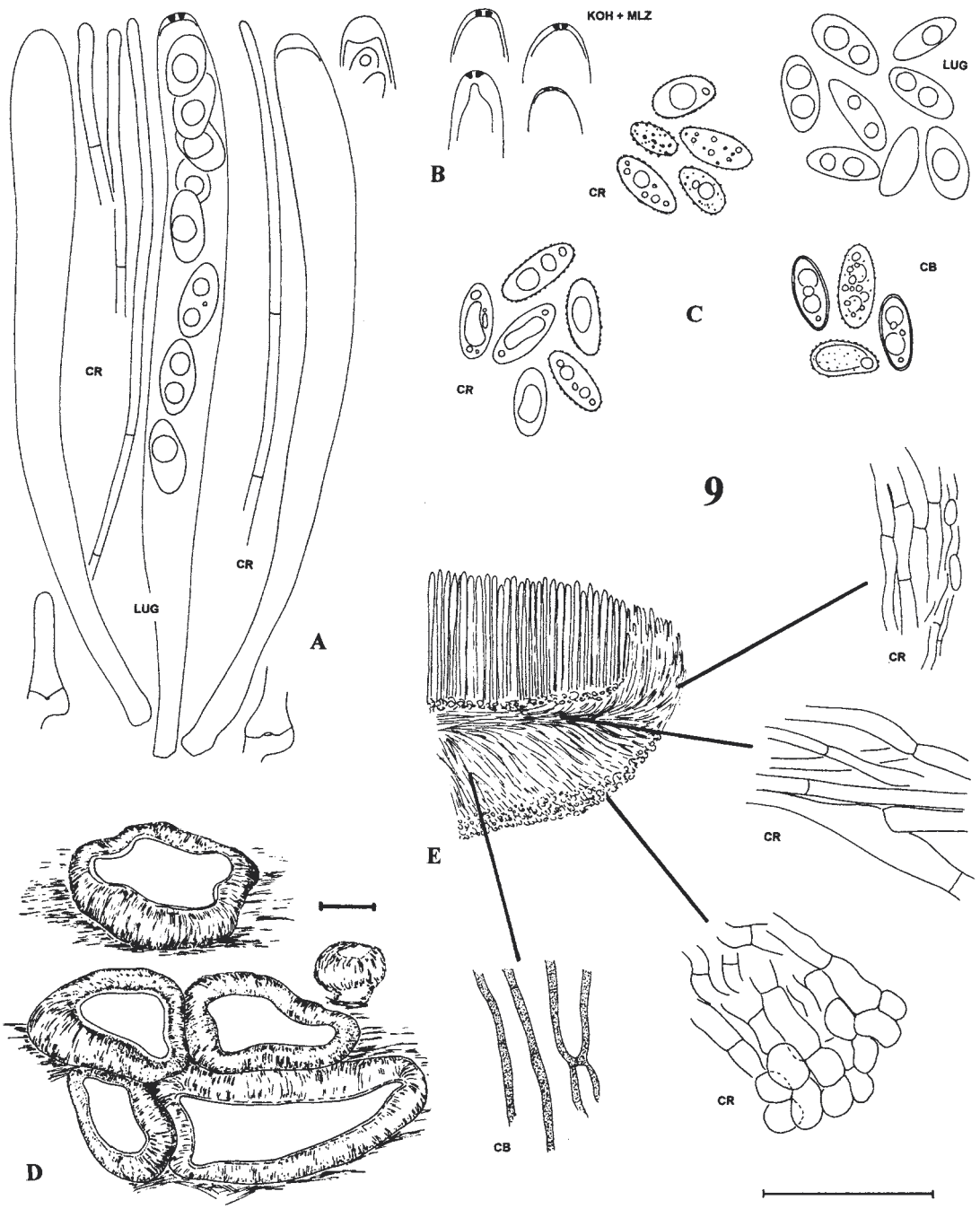


Fig. 9. *Ombrophila lilacina*, specimen *Stokland* 24509. – 9a: Asci and paraphyses. 9b: Ascus apices. 9c: Juvenile (in CR, upper) and mature ascospores. 9d: Dry apothecia. 9e: Excipular structure. – Scale 20 µm, for apothecia 200 µm.

1871; Rehm, 1896; Le Gal, 1953; Dennis, 1971; Gamundi & Romero, 1998; Ellis & Ellis, 1985). The typical roughness of the spores has, however, passed unnoticed. It was only in the provisionary, unpublished key of *Ombrophila* by H.-O. Baral (pers. comm.), where a notice on spore vesture could be found. Roughness is most pronounced in juvenile spores, but can easily be seen with oil immersion also on mature spores in standard mountants.

The pale violet colour, sessile habit, partly gelatinous structure and rough, often biguttulate and asymmetrically subfusoid spores characterize this species. Although the type has apparently never been studied, the existing concept seems to coincide with what Fries (1823) had in mind treating Wulfen's species. Of the material cited in the earlier literature, two specimens were checked. Karsten's concept coincides with the present one and a specimen in Herb. Karsten (Finland, Mustiala, 2.10.1867, Karsten, in **H**) showed rough spores. Rehm (1896) cited Rabenhorst's "Fungi Europaei no. 2106" as an example of Wulfen's *O. lilacina* with a question mark because he had seen no mature hymenium in his specimen. "Fungi Europaei no. 2106" in **H** contains a totally different species, so most likely this collection does not represent present species. Dennis (1971: 346) describes the spores as 6–8(–9) × 3–4 µm and very probably his *Neobulgaria lilacina* (Wulfen: Fr.) Dennis is a different species.

O. lilacina grows on different hardwoods: *Alnus* (1), *Betula* (4), *Salix* (1) and *Sorbus* (2). Although the data are not numerous it seems that *Betula* is a preferred substrate. This species is widely distributed (A.R. has seen collections from Estonia, Denmark and Lithuania) but not common (only 8 localities and 11 specimens in result of very careful 3-year sampling in Norway).

Specimens examined: Oppland, Østre Toten, Falken, *Betula* sp., 16 IX 1996, Stokland 6957. – Telemark, Nome, G43, *Betula* sp., 17 X 1996, Stokland 12357. – Vestfold, Larvik (Hedrum), Venannsås, *Salix* sp., 19 X 1996, Stokland 13130. – Akershus, Skedsmo, Holmen, *Alnus* sp., 27 X 1996, Stokland 13854 &14095. – Asker, Svensrud, *Sorbus aucuparia*, 7 X 1997, Stokland 23619. – Råde, Kil, *Betula* sp., 9 X 1997, Stokland 24296 & 24297. – Halden, Remmendalen, *Sorbus aucuparia*, 9 X 1997, Stokland 24460 & 24509 (TAA, TUR). – Våler, Boslangen, *Betula* sp., 10 X 1997, Stokland 24733.

Phaeohelotium trabinellum (P. Karst.) Dennis
Fig. 10

Apothecia superficial, scattered to gregarious, often confluent, sessile, 0.3–1.2 mm in diameter, saucer-shaped with distinct margins, disc and receptacle cream coloured with whitish margin when dry. Ectal excipulum composed of thin-walled, hyaline, angular to almost globose cells 8–12 µm in diameter, changing at the margin into cylindric-clavate hair-like cells, 30–45 × 3–4 µm, filled with yellowish resinous pigment turning bright red to reddish brown in MLZ. At the flanks there are scattered globose cells on the outer surface of excipulum containing yellowish pigment and reacting in the same way as marginal cells and paraphyses. *Asci* 60–80 × 7–8.5 µm in KOH (**x**= 66.5x7.8 µm, n= 10) cylindric-clavate, eight-spored, arising from croziers, apex rounded with a MLZ+ (without KOH -treatment) pore, LUG+ (blue), pore also clearly visible in KOH. *Spores* 8.8–11.6 (–13.6) × 3.2–4.4 µm, (**x**= 10.5 × 3.8 µm in CR, n= 20), hyaline, asymmetrically ellipsoid, aseptate, containing 2 big lipid guttules, sometimes germinating into cylindric-ellipsoid to slightly allantoid conidia. Paraphyses cylindrical or filiform, 2–4 or 1.6–2 µm wide, septate, the wide, cylindrical paraphyses filled in apical part with yellowish resinous pigment turning bright red to reddish brown in MLZ.

This species was published by Karsten as *Peziza trabinella* in 1869. The protologue cited material as follows: "Ad lignum putridum in Mustiala ineunte mense Octobri". There is only one specimen in Herb. Karsten (no.2200) in H, which belongs to original material and hence is the holotype (Art. 9.1). It was first restudied by Dennis (1956), who published a somewhat superficial diagnosis. Dennis cited the specimen as type but with an incorrect date (as 10.X.1867). The studied specimen was, however, no. 2200 with the correct date of 01.10.1867. Apparently also Nannfeldt (1932) had studied the same specimen, although this can only be concluded indirectly from the text ("…Durch das Studium autentischen Materials habe ich gefunden, dass folgende, von Karsten beschriebene Arten …"). Hence, the illustration on page 269 quite likely depicts the type specimen.

Karsten diagnosed a lignicolous, pallid, sessile, gregarious to confluent discomycete with relatively large, two-guttulate spores. Such a

species was frequently observed in the present material and had also caught the eye of Hans-Otto Baral (pers. com.). This led Baral to restudy the type of *P. trabinella*. Baral's informative annotations of the type and of the other material helped in naming the Norwegian specimens. The combined character set gathered from all the material collected is relatively unique. Unfortunately not all of the populations show all of the relevant characters.

The generic placement of *P. trabinella* is not clear. From the days of the original diagnosis it has been transferred into *Helotium* Tode (Karsten, 1870, 1871), *Calycina* Nees ex Gray (Kuntze, 1898), *Pachydisca* Boud. (Boudier, 1907) and *Cistella* Quél. (Nannfeldt, 1932). The latest suggestion by Dennis (1971) is used here. The hyaline but otherwise mollisioid excipulum with isodiametric to clavate cells led Dennis (1971) to group many such species into *Phaeohelotium* Kanouse.

The spore measurements given by Karsten (9–13 × 4 µm) are accurate (8.8–11.6 (–13.6) × 3.2–4.4 µm, (**x**= 10.5 × 3.8 µm in CR, n= 20). The original diagnosis gives only one contradictory feature. The paraphyses were described as rare and filiform; only 2 µm wide. Already Dennis noticed the wide paraphyses, reaching typically 3.5–4.0 µm in width. In present material all populations show both these wide paraphyses as well as truly filiform ones. The wide ones show the characteristic, dense, basal septation seen in fig. 10c. The amount of resinous pigment inside these paraphyses varies from truly eye-catching to almost zero between populations. The abundant presence is typical; only one of the studied populations showed only small traces of it. The pigment turns bright red in MLZ, but dissolves gradually into the mountant. In CR and KOH the resin persists. Inside the narrower paraphyses the amount of resinous matter is very small and most of these paraphyses are totally empty of it.

Another variable character is seen in formation of conidia on ascospores. Conidia are present in the type collection (Baral, pers. com.) and in many collections by Baral. In the present material only two populations shows conidial formation. In these specimens conidia are formed in abundance. In all other populations not a single conidium was seen. Free spores tend to be one-septate, but also this characters in variable between populations. In some one-septate spores are rare.

P. trabinellum is very common in Norway. It has been found in 49 localities on 95 individual logs. It is a really polyphagous species found on 10 different genera of trees: *Acer* (1), *Alnus* (11), *Betula* (74), *Fagus* (4), *Pinus* (1), *Populus* (3), *Quercus* (1), *Salix* (2), *Sorbus* (4) and *Tilia* (1). The main substrate for it is, however, *Betula*, and *Alnus*, too, seems to be regular substrate. The others are more or less occasional. Surprisingly enough this species growing on hardwood has been once found also on softwood.

Specimens examined: Telemark, Tokke, G33, *Alnus*, 12 IX 1996, Stokland 6662. – Akershus, Eidsvoll, L51, of *Alnus*, 17 IX 1966, Stokland 7088, 7121, 7159, 7188 & 7286. – Oppland, Nordre Land, G33, *Alnus*, Stokland 7793; 24 IX 1996, Stokland 7823. – Oppland, Nordre land, Tretjema, *Betula*, 10 X 1996, Stokland 11222, 11246, 11247 & 11330. – Oppland, Sel H¸vringen, *Alnus*, 25 IX 1996, Stokland 8016. – Oppland, Vågå Salliseten, Betula, 26 IX 1996, Stokland 8253. – Oppland, Nord Fron, F43, *Betula*, 9 X 1996, Stokland 10882. – Oppland, Steindalen, *Betula*, 10 X 1996, Stokland 11083, 11084, 11201 & 11203. Oppland, Søndre Land, F52, *Pinus*, 24 X 1996, Stokland 13378 – Telemark, Skien G42, *Sorbus*, 1 X 1996, Stokland 8825. – Telemark, Skien, L21, *Betula*, 1 X 1996, Stokland 8979 & 9043. – Telemark, Bamble, F41, *Populus*, 4 X 1996, Stokland 9603. – Telemark, Fyrestal, Rolleivstad, *Betula*, 10 X 1996, Stokland 11945, 11955, 11963, 11983, 12011, 12017, 12053 & 12073; *Sorbus*, 10 X 1996, Stokland 12144. – Telemark, Nome, G43, *Betula*, 17 X 1996, Stokland 12268, 12345 & 12429. – Telemark, Drangedal, F21, Quercus, 18 X 1996, Stokland 12780. – Akershus, Skedsmo Holmen, *Alnus*, 27 X 1996, Stokland 13885. – Enebakk, Skredderstad, *Betula*, 25 VIII 1997, Stokland 14225. – Ringsaken, Evjua, *Betula*, 28 VIII 1997, Stokland 15130. – Nore og Uvdal, Smådeldalen, *Betula*, 2 IX Stokland 15678 & 15733. – Hol, Kjerbuhovda, *Betula*, 3 IX 1997, Stokland 15979. – Hol, Skurdalen, *Betula*, 4 IX 1997, Stokland, 16087. – Ringerike, Rihueåsen, Betula, 22 IX 1997, Stokland 18882. – Ringerike, Rådalen, *Betula*, 22 IX 1997, Stokland 19337, 19444 & 19458. – Modum, Femtjemshøgda, *Betula*, 23 IX 1997, Stokland 19556. – Flå, Geitenatten, *Betula*, 24 IX 1997, Stokland 19634 & 19635. – Tinn, Fjellstul, *Betula*, 25 IX 1997, Stokland 21164 & 21168. – Porsgrunn, Hagen, *Tilia*, 1 X 1997, Stokland 21385. – Nes, Purkebekken, *Sorbus*, 24 IX 1997, Stokland 20502. – Nes, Darren, *Betula*, 25 IX 1997, Stokland 21513, 21612, 21626, 21633, 21644, 21646, 21647, 21688, 21689, 217125, 21732, 21733, 21739, 21740 & 21773. – Stokke, Askedal, *Fagus sylvatica*, 29 IX 1997, Stokland 22049. – Asker, Svensrud, *Sorbus aucuparia*, 07 X 1997, Stokland 23620, 23623 & 23643. – Råde, Kil, *Betula*, 9 X 1997, Stokland 24298. – Halden, Rem-

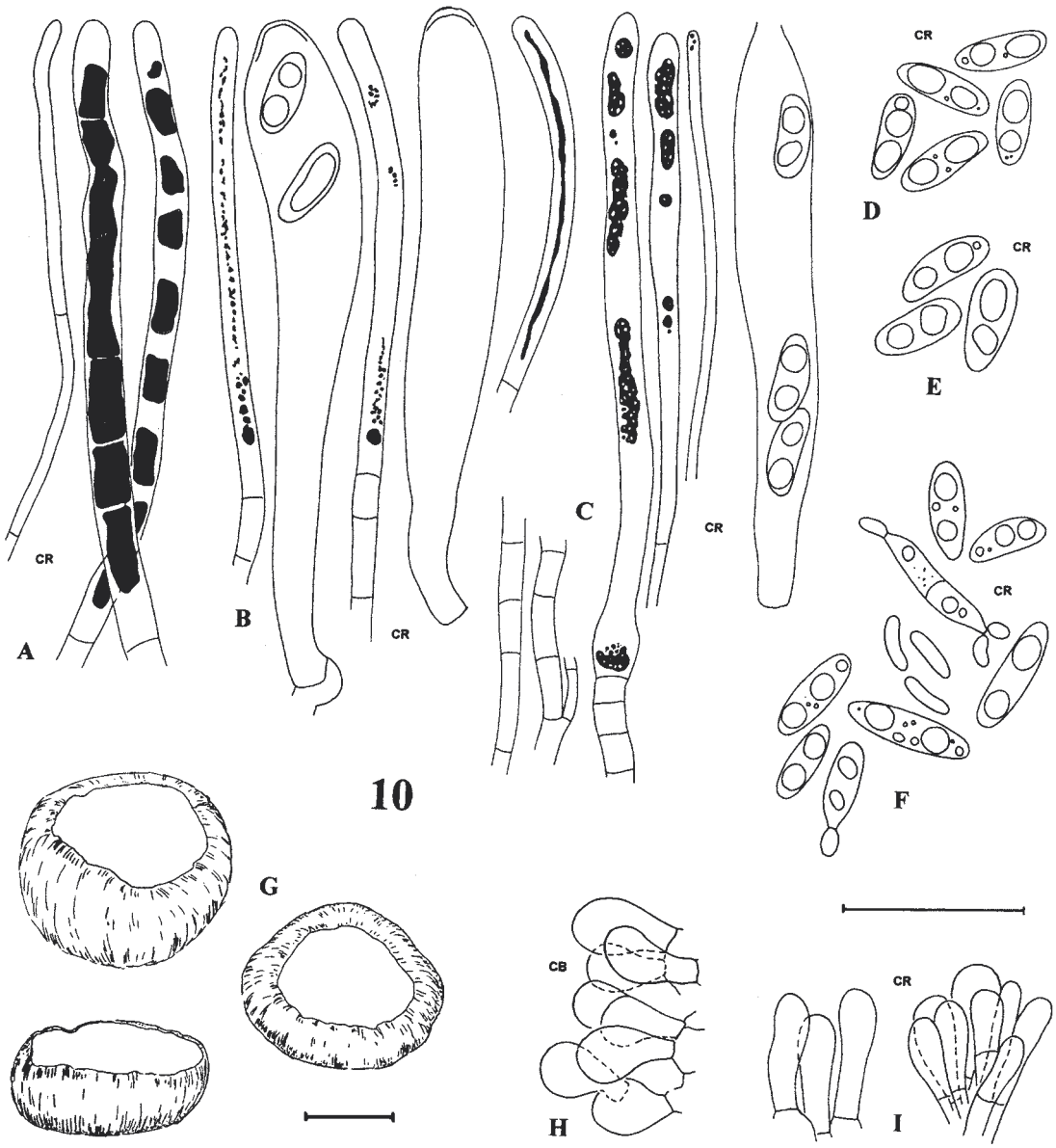


Fig. 10. *Phaeohelotium trabinellum*, specimens *Stokland* 21633, 23620, 24343, 26113, 27627. – 10a: The broad paraphyses with typical yellow resin inside. 10b: Asci and paraphyses. 10c: Ascus and the two types of paraphyses. 10d: Ascospores. 10e: Ascospores. 10f: Ascospores, showing conidial formation. 10g: Dry apothecia. 10h: Ectal excipulum from the flanks. 10i: Marginal hyphae. – Scale 20 µm, for apothecia 100 µm.

mendalen, *Acer*, 9 X 1997, Stokland 24343; *Fagus*, 9 X 1997, Stokland 24352, 24514 & 24530. – Halden, Godabergene, *Betula*, 22 X 1997, Stokland 26840 & 26875. – Halden, Finnsvika, *Betula*, 22 X 1997, Stokland 26942 & 27163. – Halden, Korsetdalen, *Betula*, 23 IX 1997, Stokland 27180. – Våler, Boslangen, *Betula*, 10 X 1997, Stokland 24640 & 24747. – Åmot, Kvernåa, *Betula*, 13 X 1997, Stokland 24847, 24892 & 24893. – Åmot, Almus, *Salix*, 13 X 1997, Stokland 24977 & 24979. – Rendalen, Kiva, *Betula*,

14 X 1997, Stokland 25238. – Alvdal, Urlia, *Betula*, 14 X 1997, Stokland 25324. – Alvdal, Baugsberget, *Betula*, 15 X 1997, Stokland 25533, 25545 & 25581. – Løten, Gitvola, *Sorbus*, 17 X 1997, Stokland 25858. – Rømskog, Steinsvika, *Populus*, 20 X 1997, Stokland 26085, 26113 & 26198. – Hurum, Burud, *Betula*, 24 X 1997, Stokland 27352. – Nannestad, Gardermoen, *Alnus*, 25 X 1997, Stokland 27542 & 27627.

Discocainia treleasei (Sacc.) J. Reid & A. Funk

Fig. 11

Apothecia erumpent, becoming superficial in an early stage of development, scattered to gregarious, sessile on a narrow base, 1–4 mm in diameter, turbinate, at first closed, opening at maturity by irregular and crenate tearing of excipulum overlying the hymenium, disc light straw yellow, amber yellow to honey yellow or caramel brown when dry, receptacle blackish, externally furfuraceous, cartilaginous to leathery when fresh or soaked, ceraceous when dry. Ectal excipulum composed of globose, thick-walled, blackish cells. Medulla composed of hyaline, thin-walled, globose cells intermixed with sparse thin walled, hyaline hyphal elements. *Asci* 100–140 × 9–12 µm in CR (**x**= 121.4x10.6 µm, n= 10) clavate, eight-spored, arising from simple septa, apex conical without differentiated pore, LUG-, MLZ-. *Spores*, 30–55 × 1.5–2.5 µm, in KOH (**x**= 40.5 × 2.1 µm, n= 20), hyaline, filiform clavate, surrounded with a gelatinous sheath scarcely visible in CR, well visible in CRB, 0–3-septate, containing numerous lipid guttules, germinating into globose to ellipsoid conidia. Paraphyses filiform, hyaline, 1.5–2.5 µm wide, sparsely septate, apically bent to coiled.

Torkelsen & Eckblad (1977) have reported the first European locality of this American species from Rana, Norway. Now six more localities are added to show that *D. treleasei* is not a rarity also on this side of Atlantic. In North America *D. treleasei* grows on *Tsuga heterophylla* and *Picea sitchensis* and is associated with cankered swellings on branches (Reid & Funk, 1966). In the Norwegian collections, however, no signs of cancer lesions are seen and the fungus is growing as a dead wood and bark saprotrophe on *Picea abies* (3), *Pinus sylvestris* (1) and *Betula* sp. (2). Its occurrence on bark of *Betula* is surprising but these specimens are fully identical with those growing on conifers.

The genus *Discocainia* Reid & A. Funk was placed into Helotiaceae subfam. Encoelioideae by its authors and it has been followed by the Scandinavian authors (Torkelsen & Eckblad, 1977; Hansen & Knudsen, 2000). Sherwood (1980) has, however, suggested that *Discocainia* has strong affinities to Rhytismataceae and this placement has been supported by Livsey & Minter (1994). In our opinion, too, *Discocainia* belongs to the Rhytismataceae because of its hymenial characters.

Specimens examined: Oppland, Nordre Land, Tretjema, *Betula*, 10 X 1996, Stokland 11283. – Telemark, Nome, G43, *Betula*, 17 X 1996, Stokland 12439. – Telemark, Kviteseid, G62, *Picea abies*, 17 X 1996, Stokland 12613. – Nes, Branden, *Picea abies*, 5 IX 1997, Stokland 16433. – Hurdal, Fellsjøkampen, *Picea abies*, 6 X 1997, Stokland 23407. – Stor-Elvdal, Koppang, *Pinus sylvestris*, 16 X 1997, Stokland 25822.

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REFERENCES

Boudier, E. 1907. *Histoire et classification naturelle des Discomycètes d'Europe*. Paris, 221 pp.

Cailleux, A. 1981. *Code des couleurs des sols*. Boubée.

Dennis, R.W.G. 1956. A revision of the British Helotiaceae in the Herbarium of the Royal Botanic Gardens, Kew, with notes on related European species. *Mycol. Pap.* 62: 1–216.

Dennis, R.W.G. 1971. New or interesting British microfungi. *Kew Bull.* 25: 335–374.

Ellis, M.B. & Ellis, J.P. 1985. *Microfungi on land plants. An identification handbook*. London & Sydney, 818 pp.

Fries, E.M. 1823. *Systema Mycologicum* 2. Lund, 621 pp.

Gamundi, I.J. & Romero, A.I. 1998. *Flora Criptogàmica de Tierra del Fuego* 10 (5): 1–131.

Hansen, L. & Knudsen, H. 2000. *Nordic Macromycetes*. Vol. 1. Ascomycetes. Nordsvamp, Copenhagen, 309 pp.

Huhtinen, S. 1990. A monograph of Hyaloscypha and allied genera. *Karstenia* 29: 45–252.

Huhtinen, S. 1993. New or less known hyaloscyphaceous fungi from the Canadian timberline. *Biblioth. Mycol.* 150: 93–103.

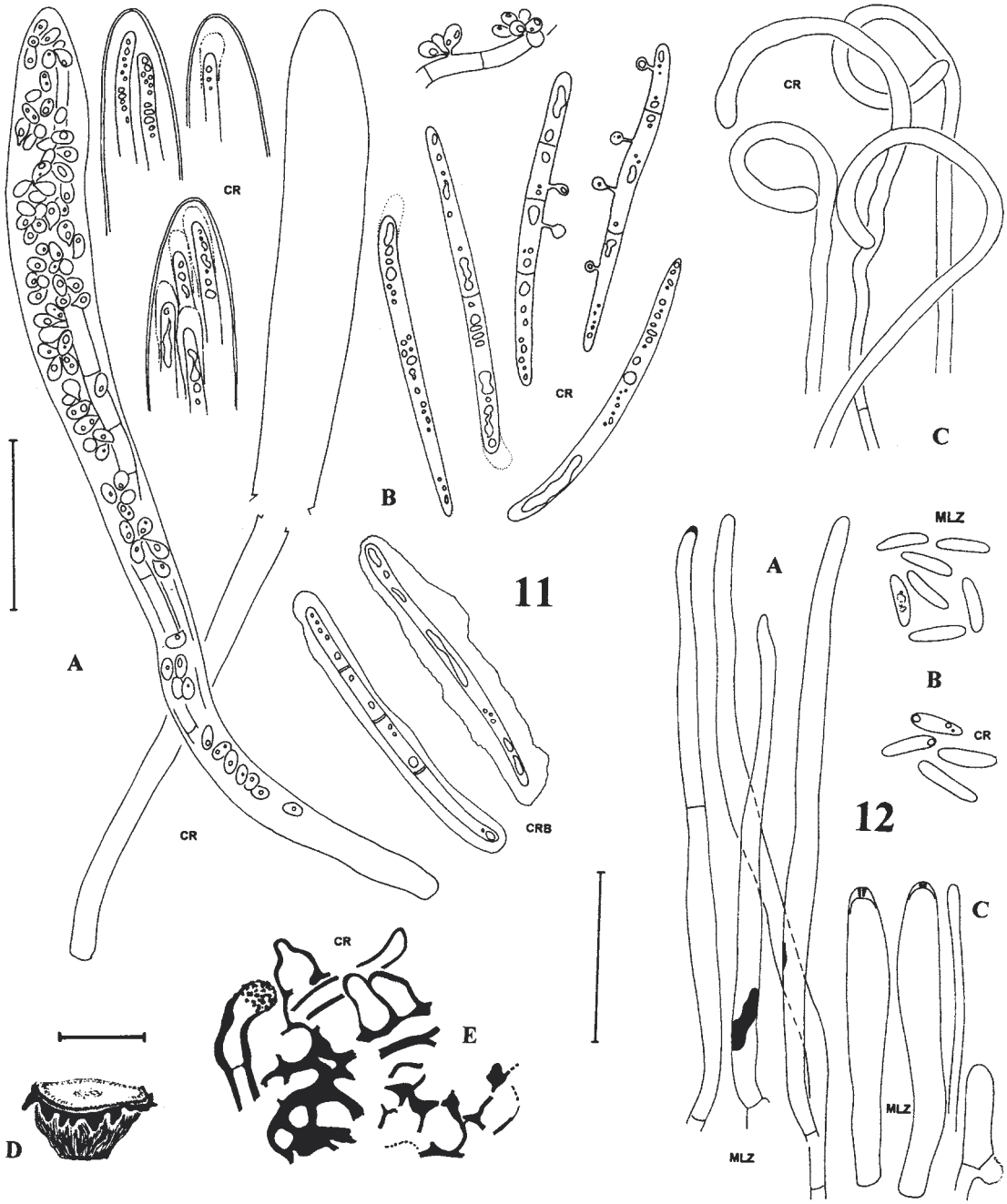

Fig. 11. *Discocainia treleasei*, specimen *Stokland* 25822. – 11a: Asci. 11b: Ascospores. 11c: Paraphyses. 11d: Dry apothecium. 11e: Surface view of ectal excipulum.

Fig. 12. *Hyaloscypha aureliella*, specimen *Stokland* 15363. – 12a: Marginal hairs. 12b: Ascospores. 12c: Asci and paraphysis. – Scale 20 µm, for apothecium 1 mm.

Karsten, P.A. 1870. Symbolae ad Mycologiam fennicam 1. *Not. Sällsk. Fauna Fl. Fenn. Förh.* 11: 211–268.

Karsten, P.A. 1871. Mycologia Fennica. *Bidrag Kännedom Finlands Natur Folk* 19: 1–250.

Kornerup, A. & Wanscher, J.H. 1967. *Methuen Handbook of Colour*. Methuen, London, 243 pp.

Kuntze, O. 1898. *Revisio generum plantarum 3*. Leipzig 576 pp.

Le Gal, M. 1953. *Les Discomycètes de Madagascar*. Paris, 465 pp.

Livsey, S. & Minter, D.W. 1994. The taxonomy and biology of Tryblidiopsis pinastri. *Canad. J. Bot.* 72 (5): 549–557.

Nannfeldt, J.A. 1932. Studien über die Morphologie und Systematik der nicht-lichenisierten inoperculaten Discomyceten. *Nova Acta Regiae Soc. Sci. Upsal.* 4(8): 1–368.

Raitviir, A. 1997. *Incrupila lignicola* Raitv. sp. nova, a new species of the Hyaloscyphaceae (Leotiales) from Norway. *Agarica* 15: 7–9.

Rehm, H. 1896. *Die Pilze Deutschlands, Oesterreichs und der Schweiz 3. Ascomyceten: Hysteriaceen und Discomyceten. Rabenh. Krypt.-Flora* 1(3): 1–1275. Leipzig.

Reid, J. & Funk, A. 1966. The genus Atropellis and a new genus of the Helotiales associated with branch cancers of western hemlock. *Mycologia* 58: 417–439.

Sherwood, M. A. 1980. Taxonomic studies in the Phacidiales. The genus Coccomyces (Rhytismataceae). *Occas. Pap. Farlow Herb. Cryptog. Bot.* 15: 1–120.

Stokland, J.N. 2001. The coarse woody debris profile: an archive of the recent forest history and an important biodiversity indicator. *Ecol. Bull.* 49: 71–83.

Svrcek, M. 1984. New or less known Discomycetes. *Ceska Mykol.* 38: 197–202.

Torkelsen, A.-E. & Eckblad, F.-E. 1977. Encoelioideae (Ascomycetes) of Norway. *Norweg. J. Bot.* 24: 133–149.

Folia Cryptog. Estonica, Fasc. 39: 27–35 (2002)

A preliminary checklist of Lithuanian Dermateaceae (Ascomycetes)

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Abstract: Seventy species belonging to 18 genera of the Dermateaceae are listed. 17 species are reported as new for Lithuania. Two new taxa, *Mollisia minima* and *Pyrenopeziza euphrasiae* var. *brevispora* are described.

Kokkuvõte: A. Raitviir ja E. Kutorga. Leedu nahktiksikuliste (Dermateaceae, Ascomycetes) nimestik.

Nimestikus tuuakse ära 70 liiki 18-st perekonnast. 17 liiki on esmasleiud Leedust. Kirjeldatakse 2 uut taksonit: *Mollisia minima* ja *Pyrenopeziza euphrasiae* var. *brevispora*.

INTRODUCTION

In the summer of 2002 the authors studied jointly a set of unidentified collections of Helotiales by the second author from Lithuania. More than 10 species of the Dermateaceae not previously reported from Lithuania were discovered in this material. The results stimulated authors to compile a preliminary check-list of Lithuanian Dermateaceae. For this purpose the first author examined his Lithuanian collections from 1965 and 1966 and fresh collections made in September 2002. As the result of this study a list comprising 70 species, 17 of them new for Lithuania and 2 new taxa for science, *Mollisia minima* Raitv. & Kutorga and *Pyrenopeziza euphrasiae* (Fuckel) Kuntze var. *brevispora* Raitv., was compiled.

The Lithuanian material of dermateaceous ascomycetes is deposited at the Institute of Botany, Vilnius (**BILAS**), Vilnius University (**WI**), and Institute of Zoology and Botany, Tartu (**TAA**).

HISTORICAL SURVEY

The data on the distribution of the Dermateaceae in Lithuania started to accumulate quite recently. Up to 1988 a total of 13 species had been registered in the country (Kutorga, 1990). Most of these species belonging to the genera *Blumeriella*, *Dermea*, *Diplocarpon*, *Drepanopeziza*, *Neofabraea*, *Pezicula* and *Pseudopeziza* were recorded in anamorphic state by phytopathologists.

The recent studies by the second author (Kutorga, 1991, 1996, 2002 and Iršenaite & Kutorga, 2001) have added more to our knowledge of saprobic Dermateaceae. The data on anamorphs of some species have been published in a monographic treatment of the order Melanconiales of Lithuania (Ignataviciute, Treigiene, 1998). Up to now 53 species of the family have been published from Lithuania. Two published species, *Micropeziza* aff. *karstenii* and *Scutomollisia* aff. *stenospora* (Kutorga, 2002) are excluded from the present list as misidentified ones. Further studies are needed to find out the identity of these collections.

DIVERSITY AND DISTRIBUTION

In total, 70 species from 18 genera of the family Dermateaceae have been recorded in Lithuania. 17 species marked with asterisk (*) are reported for the first time from Lithuania. Nearly half of the recorded species (28) belong to the genus *Mollisia*. *Mollisia cinerea*, *M. melaleuca*, *Tapesia fusca* and *Calloria neglecta* are the most common saptrotrophic species. Widespread in suitable habitats and substrates are several parasitic species, e.g. *Blumeriella jaapi*, *Neofabraea malicorticis*, *Pezicula corticola* and *Pseudopeziza trifolii*. 27 species are known in Lithuania from a single collection.

15 species are at least in some stages of their life cycle plant parasites. All other spe-

cies are saprotrophs, mainly herbosaprotrophs (on stems and leaves of herbs, grasses, rushes, reeds, sedges, ferns, totally 28 species) and xylosaprotrophs (15 species). 8 species were recorded on canes and leaves of *Rubus*, 3 – on leaves of trees, 3 – on cones, 1 – on forest litter.

LIST OF SPECIES

BELONOPSIS (Sacc.) Rehm

Belonopsis excelsior (P. Karst.) Rehm
Syn.: *Belonium excelsius* (P. Karst.) Boud., *Niptera excelsior* (P. Karst.) Dennis

Rare, found from two localities. On dead stems of *Phragmites australis*: Plunge district, Plateliai lake, 26 IX 1988; Taurage district, Viešvile Strict Nature Reserve, 27 IX 2000 (Kutorga, 1991, 2002).

B. hydrophila (P. Karst.) Nannf.
Syn.: *Tapesia hydrophila* (P. Karst.) Rehm

Common and widespread on dead stems of *Phragmites australis*, *Scirpus sylvaticus, Juncus* spp. and *Carex* spp. in wet habitats from early spring to late autumn (IV–IX). Known from 13 localities in Jurbarkas, Plunge, Prienai, Šilute and Zarasai districts and in Neringa (Kutorga, 1991, 2002).

Notes: This small-spored species of *Belonopsis* is characterized by turning bright lemon-yellow in KOH but this character is not observed in all specimens. Also the calcium oxalate crystals in medulla, the key character to the genus *Belonopsis*, are not always present. A very rich material of *B. hydrophila* collected in September 2002 in Prienai district on *Scirpus sylvaticus* was totally without crystals.

B. retincola (Rabenh.) Le Gal & F. Mangenot
Syn.: *Tapesia retincola* (Rabenh.) P. Karst.

Fairly common on dead stems of *Phragmites australis* and *Scirpus* sp. from spring to early summer (IV–VI). Known from 5 localities in Plunge and Taurage districts, and in Neringa (Kutorga, 1991, 2002).

BLUMERIELLA Arx

Blumeriella jaapii (Rehm) Arx
Syn.: *Coccomyces hiemalis* B.B. Higgins, *C. padi* (Lib.) P. Karst.
Anamorph: *Cylindrosporium hiemale* B. Higgins

Common and widespread in all Lithuania on leaves and fruits of *Cerasus vulgaris, Cerasus* sp. cult. and *Padus avium*. It is usually found as an anamorph, but there is also 1 teleomorph record from Vilnius (Kutorga, 1990, 1991; Ignataviciute, Treigiene, 1998).

CALLORIA Fr.

Calloria neglecta (Lib.) B. Hein
Syn.: *Callorina fusarioides* (Berk.) Korf

Common on dead stems of *Urtica dioica* in spring and summer (V–VII). Known from 22 localities in Jurbarkas, Kedainiai, Šilute, Širvintos, Taurage and Vilnius districts (Kutorga, 1991).

DERMEA Fr.

Dermea rosae (Sacc.) Rehm

This species has been recorded only once on *Rosa* sp. cult. by Žuklys in1960 (Ignataviciute, Treigiene, 1998).

DIPLOCARPON F.A. Wolf

Diplocarpon earlianum (Ellis & Everh.) F.A. Wolf

Anamorph: *Marssonina potentillae* (Desm.) Magnus

Common and widespread on leaves of *Fragaria* sp. cult., *F. elatior, F. ananassa, Malus domestica, Potentilla anserina, Rubus caesius* and *R. saxatilis* (Kutorga, 1990, 1991; Ignataviciute & Treigiene, 1998). Found only as anamorph.

D. mespili (Sorauer) B. Sutton
Syn.: *D. soraueri* (Kleb.) Nannf.

Anamorph: *Entomosporium mespili* (DC.) Sacc.
Syn.: *E. maculatum* Lév.

Common and widespread on leaves of *Pyrus communis* and *Pyrus* sp. cult. (Kutorga, 1990, 1991; Ignataviciute, Treigiene, 1998). Found only as anamorph.

D. rosae F.A. Wolf

Anamorph: *Marssonina rosae* (Lib.) Died.

Common on leaves of *Rosa* sp. cult. and *R. canina* in Kaunas, Mažeikiai and Vilnius districts, and in Neringa (Kutorga, 1990, 1991; Ignataviciute & Treigiene, 1998). Found mainly as anamorph, 1 record of teleomorph known from Kaunas.

DREPANOPEZIZA (Kleb.) Höhn.

Drepanopeziza ribis (Kleb.) Höhn.
Syn.: *Pseudopeziza ribis* Rehm ex Kleb.

Anamorph: *Gloeosporium ribis* (Lib.) Mont. & Desm.
Syn.: *Gloeosporidiella ribis* (Lib.) Petr.

Common and widespread on leaves of *Ribes* spp. and *Grossularia reclinata* (Kutorga, 1990, 1991; Ignataviciute & Treigiene, 1998). Found mainly as anamorph, 1 record of teleomorph from Kaunas.

HAGLUNDIA Nannf.

Haglundia elegantior Graddon
Found only once on dead twig of *Quercus robur*: Kaunas district, Kacergine, 20 III 1990 (Kutorga, 1991).

H. perelegans Nannf.
Found only once on stump wood of *Fagus sylvatica*: Šilute district, Norkaiciai botanical reserve, 22 VIII 1990 (Kutorga, 1991).

LEPTOTROCHILA P. Karst.

*Leptotrochila ranunculi (Fr.) Schüepp
Found only once on leaves of *Ranunculus cassubicus*: Šalcininkai district, 20 VIII 1999, S. Staneviciene.

MOLLISIA (Fr.) P. Karst.

Mollisia amenticola (Sacc.) Rehm
Fairly common on fallen female cones of *Alnus incana* and *A. glutinosa* from spring to autumn (IV–IX). Known from 8 localities in Pakruojis, Plunge, Taurage and Vilnius districts and in Neringa (Kutorga, 1991, 2002).

*M. arundinaceae (DC.) W. Phillips
Known from 2 localities: on dead stems of Poaceae, Plunge district, Skirpsciai forest, 8 VI 1989, E. Kutorga; on a dead culm of *Deschampsia caespitosa*, Šakiai district, Pankliške forest, 15 VIII 1989, E. Kutorga.

M. atrata (Pers.) P. Karst.
Fairly common on dead stems of *Arctium* sp., *Urtica dioica*, *Vincetoxicum officinale* and unidentified ?Apiaceae in spring and summer (V–VII). Known from 6 localities in Anykšciai, Kedainiai, Šilute, Ukmerge and Varena districts (Kutorga, 1991).

M. benesuada (Tul.) W. Phillips
Known from two localities on bark of dead twigs of *Alnus glutinosa*: Taurage district, Taurage forest, 19. V 1988; Neringa, vicinities of Juodkrante, 26 VIII 1988 (Kutorga, 1991).

M. caricina Fautrey
Known from two localities: on dead stems of *Scirpus* sp. Klaipeda district, vicinity of Nemirseta, 14.IX 1994; on dead stems of *Typha* sp., Taurage district, at the bank of Glitis lake, 27 IX 2000 (Kutorga, 1996, 2002).

M. cinerea (Batsch) P. Karst.
Very common on dead wood and bark of various trees, on fallen cones of *Picea abies*, on dead canes of *Rubus* sp. and on fallen fruits of *Fagus sylvatica* from spring to late autumn (IV–X). Found from 51 localities in Jurbarkas, Kedainiai, Marijampole, Mažeikiai, Plunge, Šalcininkai, Šilute, Širvintos, Švencionys, Taurage, Vilkaviškis, Vilnius and Zarasai districts, and in Neringa and Palanga (Kutorga, 1991, 1996, 2002).

M. clavata Gremmen
Common on dead stems of *Filipendula ulmaria* and on dead canes of *Rubus* sp. from spring to autumn (V–IX). Found from 10 localities in Gargždai, Ignalina, Kedainiai, Plunge, Šakiai, Širvintos, Taurage, Telšiai and Varena districts, and in Neringa (Kutorga, 1991, 2002).

M. coerulans Quél.
Known from 2 localities: on dead stems of *Cirsium* sp., Jurbarkas district, vincinities of Seredžius, 11 VI 1987; on dead stems of *Eupatorium cannabinum*, Taurage district, Viešvile Strict Nature Reserve, 1 IX 2000 (Kutorga, 1991, 2002).

*M. dilutella (Fr.) Gillet
Syn.: *Niptera dilutella* (Fr.) Rehm
Found only once on dead stems of *Rumex* sp., Šilute district, Rambynas forest, 21. VII 1988 E. Kutorga.
Notes: This long-spored species is a typical *Mollisia* in its ascus and paraphyse characters and placing it into *Niptera* is erroneous in the light of current generic concepts.

M. discolor (Mont.) W. Phillips
Common on bark and wood of dead branches

and twigs of various deciduous trees and shrubs from spring to autumn (IV–IX). Found from 17 localities in Jonava, Kretinga, Marijampole, Kedainiai, Plunge, Šakiai, Šilute, Taurage and Zarasai districts, and in Neringa and Palanga (Kutorga, 1991, 1996, 2002).

M. ESCHARODES (Berk. & Broome) Gremmen
Syn.: *Pyrenopeziza escharodes* (Berk. & Broome) Rehm
Not rare but seldom collected on dead canes of *Rubus idaeus* from spring to late autumn (V–X). Found from 6 localities in Kaunas, Taurage, Trakai, Varena and Vilnius districts and in Neringa (Kutorga, 2002).

M. HUMIDICOLA Graddon
Known from a single locality on dead leaves of *Carex disticha*, Šilute district, Norkaiciai botanical reserve, 11 V 1990 (Kutorga, 1991).

M. JUNCINA (Pers.) Rehm
Known from a single locality on dead stems of *Juncus* sp., Šakiai district, vicinities of Sudargas, 12 VIII 1989 (Kutorga, 1991).

M. LIGNI (Desm.) P. Karst.
Fairly common on dead wood of *Alnus incana, Betula* sp., *Corylus avellana* and *Pinus sylvestris* from spring to autumn (V–IX). Found from 7 localities in Kedainiai, Plunge, Šilute, Švencionys and Trakai districts (Kutorga, 1991, 1996).

M. MELALEUCA (Fr.) Sacc.
Very common and widespread on dead wood and bark of various trees, shrubs and on dead canes of *Rubus* sp. from spring to autumn (IV–IX). Found from 25 localities in Ignalina, Jurbarkas, Kedainiai, Klaipeda, Plunge, Šalcininkai, Taurage, Ukmerge and Vilnius districts, and in Neringa and Palanga (Kutorga, 1991, 1996, 2002).

M. MILLEGRANA (Boud.) Nannf.
Syn.: *Pyrenopeziza millegrana* Boud.
Known from a single locality on dead stems of *Filipendula ulmaria*, Plunge district, vicinities of Žvirblaiciai, 09 VI 1989 (Kutorga, 1991).

***MOLLISIA MINIMA Raitv. & Kutorga sp. nova**
Fig. 1
Apothecia superficilia, late sessilia, applanato-cupulata vel patellata, 0.1–0.4(–0.6) mm in diametro, disco obscure griseo, extus fusco-nigro, margine angusto albido, in solutione KOH flavescentia. Excipulum ectale ex cellulis globosis subcrassiter fuscotunicatis 5–8 µm in diametro compositur. Asci uncinati, cylindraceo-clavati, octospori, 35–45 × 4–5 µm, poro iodo caerulescentia praediti. Sporae irregulariter biseriatae, clavato-ellipsoideae, hyalinae, aseptatae, interdum minute biguttulatae, 6.5–9 × 1.3–2(–2.2) µm. Paraphyses filiformes, 1–1.5 µm in diametro.

In alis Tiliae e squamis conorum Laricis putridis crescit.

Species apotheciis flavescentibus, ascis minoribus e sporis brevis clavato-ellpsoideis distincta.

Apothecia superficial, broadly sessile, shallow cup-shaped to saucer-shaped, 0.1–0.4(–0.6) mm in diameter with dark gray disc, externally brownish black with a narrow whitish marginal rim. Apothecia yield pale lemon yellow stain when mounted in KOH. Ectal excipulum composed of textura globulosa, only 1–2 cell-layers thick, cells with moderately thick, dark brown walls, 5–8 µm in diameter. Asci arising from croziers, cylindric-clavate, 8-spored, api-

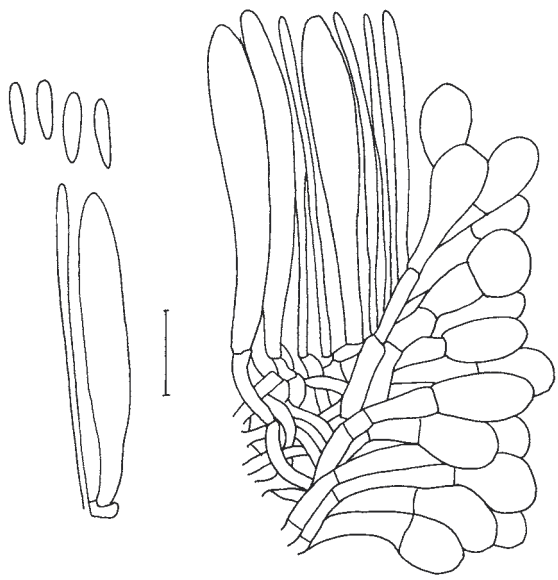

Fig. 1. *Mollisia minima* – ascus and paraphysis, ascospores and a section of apothecium margin. Bar = 10 µm.

cal pore MLZ+, 35–45 × 4–5 µm. Ascospores irregularly biseriate, clavate-ellipsoid, hyaline, aseptate, sometimes containing two small polar lipid guttules, 6.5–9 × 1.3–2 µm. Paraphyses filiform, 1–1.5 µm wide.

On *Tilia* fruit wings and *Larix* cone scales.

Holotype: On fruit wings of *Tilia platyphylla*, Šilute district, Rambyno forest, 18 VII 1988, E. Kutorga s.n. (**BILAS** 22.592), isotype **TAA** 182271).

Paratype: On fallen cones of *Larix* sp., Neringa, Juodkrante, 12 VIII 1991, E. Kutorga s.n. (BILAS 22.593).

Notes: *Mollisia minima* is recognizable in its minute, broadly sessile, flavescent apothecia, small asci and short, clavate-ellipsoid species. The two collections of it are growing on different hosts but are morphologically identical. It seems to be a forest debris species preferring to grow on semihard materials like *Tilia* fruit wings and *Larix* cone scales.

M. MORTHIERI (Sacc.) Rehm

Known from a single locality on a dead leaf of *Rubus* sp., Plunge district, Skirpsciai forest, 08 VI 1989 (Kutorga, 1991).

M. PALUSTRIS (Roberge ex Desm.) P. Karst.

Comparatively rare on dead leaves of *Carex* sp., on dead stems of a marsh plant, *Molinia* sp. and *Phragmites australis* in spring and summer (IV–VIII). found from 4 localities in Jurbarkas, Kedainiai and Švencionys districts, and in Neringa (Kutorga, 1991, 2002).

*M. PASTINACAE Nannf.
Known from a single locality on dead stems of *Aegopodium podagraria*, Neringa, vicinities of Juodkrante, 27 IV 1989 E. Kutorga.

*M. PHALARIDIS (Lib.) Rehm

Known from a single locality on *Scirpus* sp. in Prienai district, Prienai forest, Dobungis botanical preserve, 29 IX 2002 A. Raitviir.

Notes: This species is recognizable by its long and narrow fusiform 2-celled spores. It as been reported to grow on grasses and this record is the first one on the Cyperaceae. Nauta & Spooner (2000) state that *M. phalaridis* belongs to the genus *Belonopsis* and they have included it into key to *Belonopsis* species. They have, however, made no new combination. We retain it in *Mollisia* because more material should be studied to fix its taxonomic position.

M. PTERIDINA (Nyl.) P. Karst.
Known from 3 localities on dead fronds of *Pteridium aquilinum*: Šilute district, Bitenai forest, 19. VII 1988; Jurbarkas district, Jurbarkas forest, 26. VII 1988; Varena district, vicinities of Puvociai, 15 VII 2001 (Kutorga, 1991).

M. RAMEALIS (P. Karst.) P. Karst.
Probably not rare but seldom collected on fallen sticks of deciduous trees (*Alnus glutinosa, Betula* sp.) in summer and autumn. Found from 4 localities in Biržai, Ignalina and Taurage districts (Kutorga, 2002).

M. REVINCTA (P. Karst.) Rehm
Fairly common on dead stems of *Filipendula ulmaria* and on dead canes of *Rubus* sp. from spring to late autumn (V–X). Found from 8 localities in Jurbarkas, Kedainiai, Plunge, Šilute and Ukmerge districts and in Neringa (Kutorga, 1991, 2002).

M. SPECTABILIS Kirschst.
Known from a single locality on a fallen leaf of *Quercus robur*, Taurage district, Viešvile Strict Nature Reserve, 28 IX 2000 (Kutorga, 2001, 2002).

M. STROMATICA Graddon
Known from 2 localities on dead canes of *Rubus* sp.: Šilute district, Rambyno forest, 21 VII 1988; Plunge district, Beržoras forest, 23 IX 1988 (Kutorga, 1991).

"MOLLISIA" TUMIDULA (Roberge ex Desm.) Höhn.

Known from two localities on fallen leaves: on decaying leaves of *Tilia cordata*, Šakiai district, Baltkojai forest, 10. VIII 1989; on a fallen leaf of *Betula* sp., Taurage district, Viešvile Strict Nature Reserve, 11 V 1999 (Kutorga, 1991, 2002).

Notes: This species with hyaline excipulum is not a true *Mollisia* and its taxonomic position is unclear. It may have affinities toward genus *Aivenia* Svrcek comprising small *Mollisia*-like Dermateaceae with hyaline excipulum.

*M. UNDULATO-DEPRESSULA (Feltgen) Le Gal & F. Mangenot
Known from a single locality on dead wood of *Betula* sp., Ukmerge district, Šešuoliai forest, 25 IX 1997 E. Kutorga.

M. VENTOSA (P. Karst.) P. Karst.
Fairly common on dead wood of *Alnus glutinosa* and other trees in summer and autumn (VI–X). Found from 8 localities in Kedainiai, Plunge, Šilute and Ukmerge districts, and in Neringa (Kutorga, 1991).

MOLLISIOPSIS Rehm

*MOLLISIOPSIS LOBKOVICENSIS Svrcek

Known from a single locality on dead culms of a grass, Šilute district, Usenai, 21 VI 1965 A. Raitviir.

Notes: This graminicolous species which was recently described by Svrcek (1987) is probably a rare one. Our material agrees completely with the original description and illustration. Beyer (1995) reports a locality from Germany, so the Lithuanian locality is the third in the world. The authors are in opinion that *Mollisiopsis* Rehm is a good genus which is well distinguished from *Mollisia* in lanceolate paraphyses and long, hair-like marginal cells.

NEOFABRAEA H.S. Jacks.

NEOFABRAEA ALBA (E.J. Guthrie) Verkley
Syn.: *Pezicula alba* E.J. Guthrie

Anamorph: *Phlyctema vagabunda* Desm.

Common and widespread on fruits and dead bark of *Malus* sp. cult., *M. domestica*, *Rubus caesius* (Kutorga, 1990; Ignataviciute, Treigiene, 1998). Found only as anamorph.

N. MALICORTICIS H.S. Jacks.
Syn.: *Pezicula malicorticis* (H.S. Jacks.) Nannf.

Anamorph: *Cryptosporiopsis curvispora* (Peck) Gremmen
Syn.: *Cryptosporiopsis malicorticis* (Cordley) Nannf.

Common and widespread on bark and fruits of *Malus domestica* (Kutorga, 1990, 1991; Ignataviciute, Treigiene, 1998). Found mainly as anamorph, 1 teleomorph record from Kaunas.

NIPTERA Fr.

NIPTERA PILOSA (Crossl.) Boud.
Known from a single locality on a dead leaf of *Carex* sp., Plunge district, Beržoras forest, 24 IX 1988 (Kutorga, 1991).

N. PULLA (W. Phillips & Keith) Boud.
Known from 2 localities on dead culms of *Phragmites australis*: Neringa, in vicinities of Juodkrante, 15 IX 1988; Ukmerge district, Šešuoliai forest, 10 IX 1997 (Kutorga, 1991).

PEZICULA Tul. & C. Tul.

PEZICULA CARPINEA (Pers.) Tul. & C. Tul. ex Fuckel

Known from a single locality on twigs of *Carpinus betulus*, Šilute district, Rambynas forest 20 VII 1988 (Kutorga, 1991).

P. CINNAMOMEA (DC.) Sacc.
Syn.: *P. coryli* (Tul.) Tul. & C. Tul., *P. livida* (Berk. & Broome) Rehm

Anamorph:. *Cryptosporiopsis grisea* (Pers. ex Corda) Petr.

Fairly common on bark and wood of *Quercus rubra, Fagus sylvatica, Corylus avellana, Picea abies* and *Pinus sylvestris* in summer and autumn (VII–IX). Found from 6 localities in Kaunas, Kretinga, Šilute and Jonava districts, and in Neringa (Kutorga, 1991, 2001; Ignataviciute & Treigiene, 1998). Known mainly as teleomorph, one record of anamorph from Neringa.

P. CORTICOLA (C.A. Jørg.) Nannf.

Anamorph: *Cryptosporiopsis corticola* (Edgerton) Nannf.)

Common and widespread on bark of *Malus* sp. cult., *Pyrus* sp. cult. (Kutorga, 1990, 1991; Ignataviciute, Treigiene, 1998). Known mainly as anamorph, one record of teleomorph from Kaunas.

P. CORYLINA J.W. Groves

Anamorph: *Cryptosporiopsis coryli* (Peck) B. Sutton)

This species has been reported growing as anamorph on bark of *Corylus avellana* in Ignalina and Varena districts (Ignataviciute, Treigiene, 1998).

P. OCELLATA (Pers.: Fr.) Seaver
Syn.: *Ocellaria ocellata* (Pers.: Fr.) J. Schröt.

Anamorph: *Cryptosporiopsis scutellata* (Otth) Petr.

Known from 3 localities: on dead twigs of *Salix* sp., Jurbarkas district, Eržvilkas, 07. VI 1987; on dead branch of *Alnus incana*, Jurbarkas district, vicinities of Seredžius, 11. VI 1987; on dead twigs of *Alnus glutinosa*, Zarasai district, bank of Drukšiai lake, 15 V 1991 (Kutorga, 1991).

P. SPORULOSA Verkley

Anamorph: *Cryptosporiopsis quercina* Petr.

A single record of anamorph is reported from Neringa by Ignataviciute & Treigiene (1998). According to Verkley (1999) its teleomorph is *P. sporulosa* Verkley.

PIROTTAEA Sacc.

*PIROTTAEA GALLICA Sacc.

Known from a single locality on dead stems of *Urtica dioica*, Neringa, in vicinities of Juodkrante, 28 IV 1989 E. Kutorga.

Notes: This small-spored (7–9 × 1.5 µm) species differs from *P. astragali* Nannf. with the spores of the same size in the characters of lateral setae. *P. astragali* has abundant dark-coloured lateral seta but *P. gallica* only sparse tufts of hyaline hairs on the flanks of apothecium.

*P. IMBRICATA Nannf.

Known from a single locality on dead stems of *Cirsium* sp., Neringa, in vicinities of Juodkrante, 23 VIII 1988 E. Kutorga.

Notes: Another small-spored (6–8 × 1–1.5 µm) species which differs from *P. gallica* in short, aseptate, nontapering marginal setae. The setae of *P. gallica* are 30–45 × 4–5 µm

*P. SENECIONIS Nannf.
Known from a single locality on a dead stem of *Lycopus europaeus*, Šilute district, Kulynai forest, 29 VI 1988 E. Kutorga.

PODOPHACIDIUM Niessl

*PODOPHACIDIUM XANTHOMELUM (Pers.) Kavina
Known from a single locality on litter, Jurbarkas district, Viešvile Strict Nature Reserve, 10 IX 1998 E. Kutorga.

PSEUDOPEZIZA Fuckel

PSEUDOPEZIZA JONESII Nannf.
Anamorph: *Sporonema phacidioides* Desm.

Reported growing as anamorph on leaves and stems of *Medicago lupulina* in Kedainiai district (Kutorga, 1990). An insufficiently known species.

P. MEDICAGINIS (Lib.) Sacc.
Common and widespread on various parts of *Medicago lupulina, M. falcata* and *M. sativa* (Kutorga, 1990, 1991). Known from leaf spot symptoms and as teleomorph (one collection from Kaunas in WI seen).

P. MELILOTI Syd.
On leaves of *Melilotus albus* and *Melilotus* spp., probably widespread but insufficiently known (Kutorga, 1990, 1991). A teleomorph collection from Šilute district seen in BILAS.

P. TRIFOLII (Biv.) Fuckel
Common and widespread on leaves and other parts of *Trifolium* spp. and *T. pratense* (Kutorga, 1990, 1991). Known from leaf spot symptoms and as a teleomorph collection from Šakiai district.

PYRENOPEZIZA Fuckel

*PYRENOPEZIZA ARENIVAGA (Desm.) Boud.
Known from a single locality on dead stems and leaves of *Ammophila arenaria*, Neringa, vicinities of Pervalka, 5 X 1988 E. Kutorga.

*"PYRENOPEZIZA" BETULICOLA Fuckel

Known from a single locality on fallen leaves of *Betula pendula*, Plunge district, Skirpsciai forest, 8 VI 1989 E. Kutorga.

Notes: This is a species of unclear taxonomic position. Hein (1976) has described it in detail but found for it no genus in the subfamily Naevioideae. The structure of ectal excipulum strongly suggests its placing into Naevioideae but there seems to be no appropriate genus at the moment.

***PYRENOPEZIZA EUPHRASIAE (Fuckel) Kuntze var. BREVISPORA Raitv. var. nov.** – Fig. 2.
Pyrenopezizae euphrasiae similis, sporis brevibus 12–17 × 2.5–3.5 µm aseptatibus differt. In caulibus siccis Angelicarum crescit.

Apothecia erumpent, becoming superficial, broadly sessile, shallow cup-shaped, 0.5–1 mm in diameter, with curved in margins when dry, externally velvety brownish-black, with dark yellowish-gray hymenium. Ectal excipulum composed of textura globulosa, cells moderately thick-walled, dark brown, 5–10 µm in diameter. Asci arising from croziers, cylindric-clavate, 8-spored, apical pore blue in MLZ, 55–70 × 6–8 µm. Ascospores clavate, hyaline, aseptate, containing two big or several small lipid globules, 12–17 × 2.5–3.5 µm. Paraphyses filiform, 1.5 µm wide.

On dead stems of *Angelica* sp.

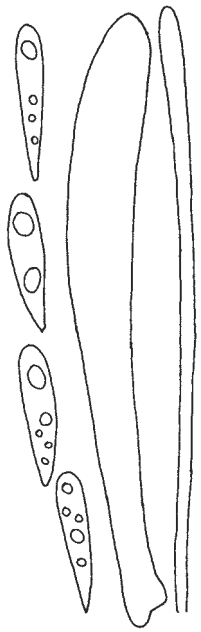

Fig. 2. *Pyrenopeziza euphrasiae* var. *brevispora* – ascus, paraphysis and ascospores. Bar = 10 µm.

Specimen examined: Lithuania, Prienai district, Gojaus forest; Stakliškes forestry lot, forest area 23, 54°34' N, 24°16' E, on a dead stem of *Angelica* sp., 27 IX 2002 A. Raitviir (Holotype in TAA 182264).

Notes: *Pyrenopeziza euphrasiae* is the only species of *Pyrenopeziza* characterized by clavate to clavate-fusoid spores. Its spore size is variable, Rehm (1896) describes them as 15–21 × 2.5–3 µm, becoming 1-septate, and Hütter (1958) as 20–30 × 3–4 µm, becoming 4-septate. It has been reported growing only on Scrophulariaceae: *Euphrasia* spp, *Odontites* spp and *Rhinanthus* spp. The Lithuanian collection is growing on different host family and has shorter aseptate spores. It should be distinguished from typical *P. euphrasiae* giving it varietal rank.

*P. MOUTONII Rehm
Known from a single locality on dead stems of Apiaceae, Šilute district, vicinities of Šilute, 21 VI 1965 A. Raitviir.

P. PLICATA Rehm
Known from a single locality on a dead stem of *Angelica sylvestris*, Rudninkai forest, Šalcininkai district, 8 IX 1994 (Kutorga, 2001).

P. RUBI (Fr.) Rehm
Not rare on dead canes of *Rubus idaeus* from spring to autumn (V–IX). Known from 5 localities in Jurbarkas, Plunge, Taurage and Klaipeda districts, and in Neringa (Kutorga, 1991).

TAPESIA Fuckel

TAPESIA FUSCA (Pers.: Fr.) Fuckel

Common and widespread on dead bark and wood of *Alnus glutinosa, A. incana, Corylus avellana, Frangula alnus, Quercus robur, Salix* sp. and *Tilia cordata* from spring to autumn (IV–X). Found from 27 localities in Alytus, Anyksciai, Kedainiai, Klaipeda, Mažeikiai, Plunge, Prienai, Šakiai, Šilute, Širvintos, Varena, Vilnius and Zarasai districts and in Neringa and Palanga (Kutorga, 1991, 2001).

*T. LIVIDO-FUSCA (Fr.) Rehm
Known from a single locality on dead wood of *Pinus sylvestris*, Moletai district, at Aišetas lake, 8 VII 1966 A. Raitviir.

T. STROBILICOLA (Rehm) Sacc.
Known from a single locality on a fallen cone of *Pinus sylvestris*, Neringa, vicinities of Juodkrante, 29 IV 1989 (Kutorga, 1991)

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REFERENCES

Beyer, W. 1995. Über einige bemerkenswerten Discomyceten aus Oberfranken (Nordbayern). *Z. Mykol.* 61: 3–9.

Hein, B. 1976. Revision der gattung Laetinaevia Nannf. (Ascomycetes) und Neuordnung der Naevioideae. *Willdenowia,* Beih. 9: 1–135.

Hütter, R. 1958. Untersuchungen über die Gattung *Pyrenopeziza* Fuck. *Phytopathol. Z.* 33: 1–52.

Ignataviciute M. & Treigiene A. 1998. Acervulieciai (*Melanconiales*). *Lietuvos grybai [Mycota Lithuaniae]* Vol. 9. Vilnius. 246 pp.

Iršenaite R. & Kutorga E. 2001. Discomycetes inhabiting oak (*Quercus*) leaves and fruits in Lithuania. *Biologija* 3: 18–20.

Kutorga E. 1990. Istoricheskii obzor izucheniya diskomicetov Litvi i napravleniya dal'neishikh ikh isledovanii. *Ekologija* 2: 40–52.

Kutorga E. 1991. *Vakaru ir Pietvakariu Lietuvos diskomicetai (rušine sudetis, paplitimas ir struktura)* [Discomycetes of western and south-western parts of Lithuania (species composition, distribution and structure); doctoral thesis]. Vilnius.

Kutorga E. 1996. Mycological and lichenological investigations in the former soviet military forestries in Lithuania. Discomycetes. *Botanica Lithuanica* 2: 221–232.

Kutorga E. 2002. Discomycetes of Viešvile Strict Nature Reserve. 1. Diversity and distribution. *Botanica Lithuanica* 8: 77–90.

Nauta, M. M. & Spooner, B. 2000. British Dermateaceae: 4B. Dermateoideae Genera B-E. *Mycologist* 14: 21–28.

Rehm, H. 1896. Die Pilze Deutschlands, Oesterreichs und der Schweiz 3. Ascomyceten: Hysteriaceen und Discomyceten. *Rabenh. Krypt.-Flora* 1 (3): 1–1275. Leipzig.

Svrcek, M. 1987. New or less known discomycetes. XVI. *Ceska Mykol.* 41: 88–96.

Verkley, G.J.M. 1999. A monograph of *Pezicula* and its anamorphs. *Stud. Mycol.* 44: 1–176.

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Lichens and lichenicolous fungi of the Hiiumaa Islets Landscape Reserve (Estonia)

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Abstract: The study deals with lichens, lichenicolous and allied fungi of the Hiiumaa Islets Landscape Reserve comprising 25 islets and the saltmarsh of Salinõmme in Hiiumaa Island. The list includes 299 species, of which 13 are reported as new for Estonia (*Bispora lichenum*, *Caloplaca crenularia*, *Endococcus perpusillus*, *E. propinquus*, *E. rugulosus*, *Gyalecta subclausa*, *Hypocenomyce praestabilis*, *Laeviomyces pertusariicola*, *Lecanora andrewii*, *Licheniconium pyxidatae*, *Muellerella lichenicola*, *M. pygmaea*, *Taeniolella delicata*). Changes in distribution and frequency data are suggested for 42 taxa. The islets of the landscape reserve could be divided into four groups according to composition and abundance of lichen species.

Kokkuvõte: Hiiumaa Laidude Maastikukaitseala samblikud ja lihhenikoolsed seened.

Artikkel käsitleb Hiiumaa Laidude Maastikukaitseala 25 laiu ja Salinõmme soolaku samblikke, lihhenikoolseid ja neile lähedasi seeni. Nimekiri sisaldab 299 liiki, millest 13 (*Bispora lichenum*, *Caloplaca crenularia*, *Endococcus perpusillus*, *E. propinquus*, *E. rugulosus*, *Gyalecta subclausa*, *Hypocenomyce praestabilis*, *Laeviomyces pertusariicola*, *Lecanora andrewii*, *Licheniconium pyxidatae*, *Muellerella lichenicola*, *M. pygmaea*, *Taeniolella delicata*) on leitud esmakordselt Eestist. Esitatakse täiendavaid andmeid 42 taksoni leviku ja sageduse kohta Eestis. Samblike liigilise koosseisu ja ohtruse alusel saab maastikukaitseala laiud jaotada neljaks grupiks.

INTRODUCTION

Estonia is a country rich in islands, 1520 islands and islets lie on its western and northern coasts (Kildema & Annuka, 1976). The lichen flora of West-Estonian Archipelago has been investigated occasionally since 19th century (Luce, 1823, Bruttan, 1870 etc.). Significant floristic analysis about lichens in western islands was compiled in 1986 (Randlane, 1986). Besides this, species inventories were carried out in numerous islands and islets (e.g. Randlane, 1981, 1984, 1993, Martin et al., 2000).

Several aspects of biodiversity on the islets in southwestern waters of Hiiumaa Island have been investigated already for years (Rebassoo, 1960, Leito & Leito, 1991, Mägi, 1995, 1997). Still, the data about lichens of this area are insufficient. This floristic study deals with the lichen flora of Hiiumaa Islets Landscape Reserve. The following aims are posed: 1) to present species list for the landscape reserve; 2) to supplement frequency and distribution data about Estonian lichens and lichenicolous fungi; and 3) to compare the similarity of lichen species compositions on islets.

The Hiiumaa Islets Landscape Reserve is located in Hiiu County, in western Estonia (Fig. 1). The landscape reserve embrace islets in southwestern waters of Hiiumaa Island, the sea tract and the saltmarsh of Salinõmme in Hiiumaa. Total area is 2.663 ha. The administrative centre of the reserve is located in Salinõmme village. The distance from Salinõmme port to the farthermost islet is about 18 km. The landscape reserve was founded in 1971 to protect unique nature of islets. The saltmarsh of Salinõmme and sea tract were merged to the reserve later, in 1998. The Hiiumaa Islets Landscape Reserve belongs to the directory of Wetlands of International Importance (Ramsar site) since 1997 (http://www.hiiulaiud.ee).

The islets are higher parts of earlier sea ground raised above sea level as a result of the uplift of the earth's crust (Sepp, 1970). The islets around Hiiumaa are relatively young, the formation started in stage of Limnea Sea, about 2000 years ago (Kessel, 1961). The formation and disappearance of islets, their joining together or to the mainland continues today as well, due to constant and relatively rapid neotectonic uplift. It is calculated that the land in northwestern Estonia rises about 3.5 mm a year (Zhelnin, 1958).

The islets of the Hiiumaa Islets Landscape Reserve vary by age, size, and vegetation. Most

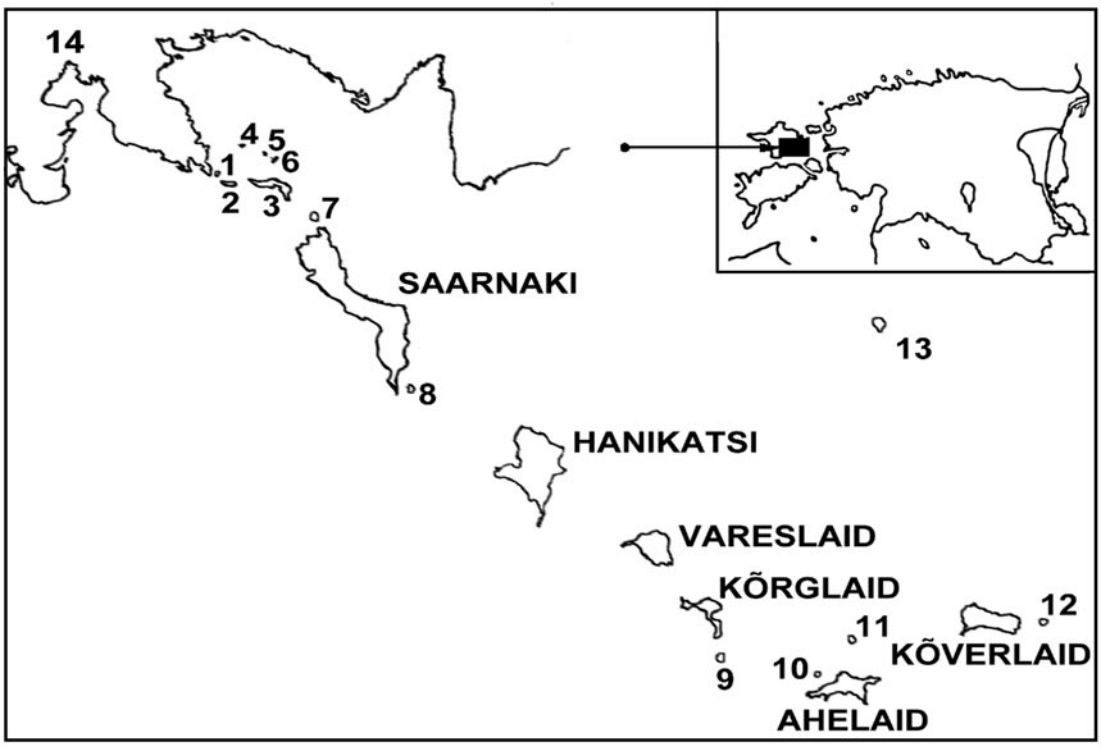

Fig. 1. The location of Hiiumaa Islets Landscape Reserve. Small islets and the saltmarsh are numbered as follows: 1 – Hoburahu, Kivirahu, Sitakare; 2 – Auklaid; 3 – Öakse; 4 – Valgekare; 5 – Väike-Pihlakare; 6 – Suur-Pihlakare; 7 – Kajakarahu, Palgirahu, Pähkrahu, Säinarahu; 8 – Oorahu; 9 – Hanerahu, 10 – Ankrurahu; 11 – Aherahu; 12 – Hülgerahu; 13 – Langekare; 14 – the saltmarsh of Salinõmme.

of the islets of the landscape reserve consist of moraine, which was formed as a result of the action of sheet glacier. Only Langekare is based on the limestone base bottom. The shores are mostly covered with shingle, less with sand. Abundance of erratic blocks and beach barriers are characteristic to this region (Leito & Leito, 1991). The size of the islets varies from 0.1 ha (e.g. Pähkrahu, Säinarahu, Kivirahu) to 140 ha (Saarnaki) (Table 1). The smallest islets are periodically inundated by sea-water and only a few typical coastal plants (e.g. *Honkenya peploides*, *Aster tripolium*, *Atriplex litoralis*) grow there. The vegetation of the biggest islets (Ahelaid, Kõverlaid, Kõrgelaid, Vareslaid, Hanikatsi, Saarnaki) is complex and composed of different biotopes: decideous forests (with *Betula* spp., *Fraxinus excelsior*, *Populus tremula*, *Tilia cordata* etc.), pine forest (*Pinus sylvestris*), shrublands (with *Juniperus communis*, *Rhamnus cathartica*, *Ribes alpinum* etc.), wooded meadows, grasslands, coastal meadows, reed-beds (Leito & Leito, 1991, Mägi, 1995, 1997).

Human activities (farming, sheep pasture etc.) affected the nature and especially the vegetation in some islets for centuries: people lived in Hanikatsi till 1964 and Saarnaki till 1973. Sheep were pastured also in Ahelaid, Kõrgelaid, Kõverlaid and Vareslaid until the 1970-ies (Leito & Leito, 1991). At the present time the administration of the landscape reserve organises brushwood cutting, hay mowing and sheep pasture on Hanikatsi, Saarnaki and Kõrgelaid to maintain the landscape appearance.

Saltmarshes are coastal meadows which are flooded by marine waters at different times of the year. The soil is salty, due to concentration of salts through evaporation of the sea-water. The

Table 1. The area (ha) and species number of lichens, lichenicolous and allied fungi on studied islets and the saltmarsh of Salinõmme

	Abb-reviations	Area (ha)	Species number
Ahelaid	Ah	17.0	93
Aherahu	–	0.1	0
Ankrurahu	An	0.3	14
Auklaid	Au	1.2	77
Hanerahu	Har	1.2	28
Hanikatsi	Han	82.0	197
Hoburahu	Ho	0.1	10
Hülgerahu	–	0.1	0
Kajakarahu	Ka	0.1	18
Kivirahu	Ki	0.1	2
Kõrgelaid	Kõr	16.0	101
Kõverlaid	Kõv	20.0	85
Langekare	La	1.2	25
Luigerahu	Lu	0.1	4
Oorahu	Oo	0.1	6
Öakse	Öa	7.6	101
Palgirahu	Pa	0.1	27
Pähkrahu	Pä	0.1	2
Saarnaki	Saa	140.0	164
Säinarahu	Sä	0.1	2
Sitakare	Si	0.1	14
Suur-Pihlakare	Sp	0.3	25
Valgekare	Val	0.2	7
Vareslaid	Var	31.0	101
Väike-Pihlakare	Vp	0.2	26
saltmarsh of Salinõmme	Sal	231.0	84

annual, halophilic plants dominate in vegetation of this habitat. The saltmarsh of Salinõmme (231 ha) is situated in southeastern part of Hiiumaa Island.

MATERIAL AND METHODS

25 islets (Ahelaid, Aherahu, Ankrurahu, Auklaid, Hanerahu, Hanikatsi, Hoburahu, Hülgerahu, Kajakarahu, Kivirahu, Kõrglaid, Kõverlaid, Langekare, Luigerahu, Oorahu, Öakse, Palgirahu, Pähkrahu, Saarnaki, Säinarahu, Sitakare, Suur-Pihlakare, Valgekare, Vareslaid and Väike-Pihlakare) and the saltmarsh of Salinõmme were investigated by both authors during the summer period in 2001. Earlier records used were based on samples collected from Saarnaki and Hanikatsi by Enel Sander (unpublished data, 1974), from Saarnaki, Hanikatsi, Kõrgelaid and Hanerahu by Tiina Randlane (Randlane, 1986) and from Saarnaki by Juhani Püttsepp (unpublished data, 1986).

All biotopes with different kind of substrate types, suitable for growth of lichens, were studied thoroughly. Species lists were compiled for every islet and for the saltmarsh of Salinõmme. The specimens that were not identified in the field were collected for further investigation (560 samples). The specimens were determined with routine techniques (incl. hand-made cross-sections of fruitbodies, light microscopy, spot colour tests etc.). Standardised methods of thin layer chromatography (TLC) (Culberson & Kristinsson, 1970) were used for identification of lichen substances. All collections are deposited in the lichenological herbarium of University of Tartu (TU).

Hierarchical Cluster Analysis was performed with PC-ORD 4.14 (McCune & Mefford, 1999) to estimate similarity of lichen species composition on islets. Relative Sørensen distance measure and farthest neighbour linkage method were employed in cluster analysis. The relative abundance of every lichen species on every islet was evaluated on a four-point scale (1 – one specimen per islet, 2 – up to 10 specimens, 3 – sporadically, found only in some places or on particular substrates, 4 – numerous). The species appearing only once or twice in the data set were removed from the analysis.

RESULTS AND DISCUSSION

General data about lichen flora

The lichen flora in the Hiiumaa Islets Landscape Reserve is rich in species and unique, the total number of species registered in the landscape reserve is 299 (Appendix). This number of species is approximately 30% of 930 taxa currently reported from Estonia (Randlane, unpublished data) and almost half (48%) of the 624 taxa known from western islands of Estonia (Randlane et al., 2002). 271 lichens, 24 lichenicolous fungi and two non-lichenized fungi allied to

lichens are found from 23 islets. There were no lichens at all on two small islets, Aherahu and Hülgerahu. 83 lichens, four lichenicolous fungi and one non-lichenized fungus were found from the saltmarsh of Salinõmme. 15 species are found for the first time from the region of western islands, and eleven taxa registered in the landscape reserve are new for Estonia (Appendix).

According to the distribution data of lichenized and lichenicolous species in the landscape reserve, we suggest that the frequency classes (Randlane & Saag, 1999) be changed for 42 Estonian taxa. Most of the changes embrace species rare in Estonia e.g. from very rare (1–2 localities in Estonia) to rare (3–5 localities) – 12 cases and from rare to rather rare (6–10 localities) – 12 cases.

Taking into account the changes of frequency classes, most species of the landscape reserve (225 species, 75%) are rather frequent (11–20 localities), frequent (21–50 localities) or very frequent (more than 50 localities) in Estonia. 77 species (25%) are very rare, rare or rather rare in our country. Majority of the rare species belong to the following groups: lichenicolous fungi or lichens (22), saxicolous on granite (17 species) and saxicolous on limestone (10). Among these species, many changes of frequency class are proposed here (26 cases in saxicolous species, 9 cases in lichenicolous fungi). The larger proportion of rare species among those species groups compared to species on other substrates is also pointed out by Randlane et al. (2002). The reason might be insufficient knowledge about saxicolous lichen communities and lichenicolous fungi in Estonia (Randlane et al., 2002).

New and noteworthy species for Estonia

***Bispora lichenum* Diederich** is a lichenicolous fungus which grows inside apothecia of various epiphytic crustous lichens. It was first described from Luxemburg (Diederich, 1990) but by now has also been found in a few other European countries (Alstrup 1993, Brightman, 1991) and North America (Cole & Hawksworth, 2001). The species was found once, from *Lecania cyrtella* in pine-forest of the salt marsh of Salinõmme. ***Caloplaca crenularia* (With.) J. R. Laundon** is a saxicolous species and belongs to *Caloplaca ferruginea* complex. It has dark grey thallus and rust-red to reddish-brown, slightly flexuose apothecia. The species is widespread, in Europe its distribution area extends from Scandinavia to Mediterranean region (Nimis, 1993). *C. crenularia* was collected twice, from granite shingle in southern coast of Auklaid and Öakse. ***Endococcus perpusillus* Nyl.** is a lichenicolous fungus which grows on thallus of different saxicolous crustose lichens, especially on *Rhizocarpon*. It is widely distributed in Europe, North America and New Zealand (Triebel, 1989). The species was determined from different *Rhizocarpon* species on Hanikatsi, Kõverlaid, Auklaid and Öakse. ***Endococcus propinquus* (Körb.) D. Hawksw.** is another lichenicolous fungus which grows on thallus of various saxicolous lichens (*Porpidia*, *Verrucaria* etc.). The species is extensively distributed all over the world (Triebel, 1989). *E. propinquus* was determined on thallus of *Verrucaria nigrescens* collected from Saarnaki. ***Endococcus rugulosus* Nyl.** is a lichenicolous fungus which is restricted to saxicolous nonlecideoid lichens (*Aspicilia*, *Ionaspis* etc.). The species is found all over the world (Triebel, 1989). It was determined from *Aspicilia cinerea* on Hanikatsi. ***Gyalecta subclausa* Anzi** is a lichen which grows on limestone. The species is similar to *Gyalecta jenensis* but differs from it by smaller apothecia and shape and size of ascospores (Vězda, 1969). It prefers shaded and damp habitats and its distribution area extends from northern to central Europe (Fröberg, 1989). *G. subclausa* included in the Red Data Book of Finland as a disappeared species (Kuusinen et al., 1995) and of Sweden as a vulnerable species (Thor & Arvidsson, 1999). The species was collected once, from limestone shingle in central part of Kõverlaid. ***Hypocenomyce praestabilis* (Nyl.) Timdal** is a lignicolous lichen. It resembles *Hypocenomyce sorophora* but differs from it mainly in the absence of soralia. The species is distributed in southern and central Scandinavia, central Europe and North America. In Scandinavia it prefers to grow on old wooden fences and buildings in agricultural areas (Timdal, 1984). *H. praestabilis* was collected once, from an old wooden windmill on Saarnaki. ***Laeviomyces pertusariicola* (Nyl.) D. Hawksw.** is a lichenicolous fungus which is specialized to *Pertusaria pertusa* and allied species. It is widespread in Europe but reported also from North America (Hawksworth, 1981) and Africa (Hafellner, 1996).

L. pertusariicola was found once from *P. pertusa* on Saarnaki. ***Lecanora andrewii* de Lesd.** is a saxicolous lichen and grows usually on granite. It is close to the *Lecanora dispersa* group but differs from it by chemical reactions. The species is characteristic to supralittoral area of maritime rocks and is distributed in coastal region of western and northern Europe (Purvis et al., 1992). *L. andrewii* was collected from 10 islets (Ahelaid, Auklaid, Ankrurahu, Hanerahu, Hanikatsi, Kõrgelaid, Langekare, Luigerahu, Öakse, Suur-Pihlakare) and also from the saltmarsh of Salinõmme. ***Lichenoconium pyxidatae* (Oudem.) Petr. & Sydow** is a lichenicolous fungus which grows on podetia of *Cladonia* spp. and *Cladina* spp. (Hawksworth, 1981). It is widespread in Europe but is also reported from North America (Triebel et al., 1991). The species was determined once, from podetia of *Cladonia pyxidata* on Saarnaki. ***Muellerella lichenicola* (Sommerf. : Fr.) D. Hawksw.** is a lichenicolous species, which grows on crustose saxicolous calcicolous lichens. It is widely distributed in Europe, North America and New Zealand (Triebel, 1989). The species was determined from Ahelaid (on *Verrucaria muralis*), Auklaid (on *Verrucaria* sp. and *Caloplaca* sp.) and Hanikatsi (on *Lecidella stigmatea*). ***Muellerella pygmaea* (Körb.) D. Hawksw.** is another lichenicolous fungus which grows on crustose saxicolous siliceous lichens. The species is extensively distributed all over the world (Triebel, 1989). It was determined on Vareslaid (on *Lecidea fuscoatra*) and Öakse (on *Lecidea lapicida* var. *pantherina*). Triebel (1989) separated three varieties by size and colour of ascospores, but also by host preferences. Both Estonian specimens belong to var. *pygmaea*. ***Taeniolella delicata* M. S. Christ. & D. Hawksw.** is a lichenicolous hyphomycete fungus, which usually grows in apothecia of different crustose lichens. The fungus inhibits ascus and ascospores production of host lichen and finally destroys it. The species is widely known in Europe (Hawksworth, 1979) but found only once in Estonia, from apothecia of *Amandinea punctata* on Sitakare.

Three lichen species listed in the Red Data Book of Estonia (Randlane, 1998) were found from the islets. ***Leptogium* subtile (Schrad.) Torss.** which belongs to the category 'extinct or probably extinct' species was collected from Hanikatsi. This terricolous calcicolous species was recently determined from Kaseküla alvar in West-Estonia (Randlane, unpublished data) and therefore the category should be altered. **Hypocenomyce sorophora (Vain.) P. James & Poelt** (category 'rare species') was already proposed for re-qualifying as frequent taxon in Estonia and should therefore be excluded from the Red Data Book (Jüriado et al., in press). 'Care demanding' species, **Nephroma parile (Ach.) Ach.** was identified from base of *Fraxinus excelsior* in Kõrgelaid. This old woodlands species is sensitive to air pollution and destruction of suitable habitats (Trass & Randlane, 1994).

***Adelolecia kolaënsis* (Nyl.) Hertel & Rambold**, a crustose species that was considered to be extinct in Estonia (Suija, 1998), was re-found from Hanikatsi and Saarnaki. This circumpolar holarctic lichen is usually saxicolous but sometimes grows also on old weathered wood (Hertel & Rambold, 1995). It was found on the walls of an old windmill on Saarnaki and on wooden fence posts on Hanikatsi.

Short description of lichen flora

Based on the results of cluster analysis the islets could be divided into four groups (Fig. 2). The first cluster (Kivirahu, Säinarahu, Pähkrahu) consists of islets where only a few typical epilithic supralittoral lichens (*Caloplaca scopularis*, *Verrucaria maura*) grow. The size of these islets is up to 0.1 ha (Table 1) and they are periodically under sea-water. The second cluster (Luigerahu, Hoburahu, Oorahu, Valgekare) comprises islets where also only saxicolous species are found, but these islets are richer in species than islets of previous cluster (Table1). Siliceous species, characteristic to nitrophilous and well-lit surroundings (e.g. *Physcia tenella* var. *marina*, *Rinodina gennarii*, *Xanthoria parietina*) grow in Hoburahu, Luigerahu and Oorahu. Valgekare is somewhat exceptional as only calcicolous species are found there. The size of these islets varies from 0.1 ha to 0.2 ha. The vegetation is poor, composed of only reed-beds and graminaceous communities. The third cluster (Langekare, Hanerahu, Ankrurahu, Suur-Pihlakare, Väike-Pihlakare, Sitakare, Kajakarahu, Palgirahu, Luigerahu) comprises islets where the lichen flora is more heterogenous than in previous groups. A few epiphytic species (e.g. *Lecidella elaeochroma*, *Lecanora carpinea*, *Phys-*

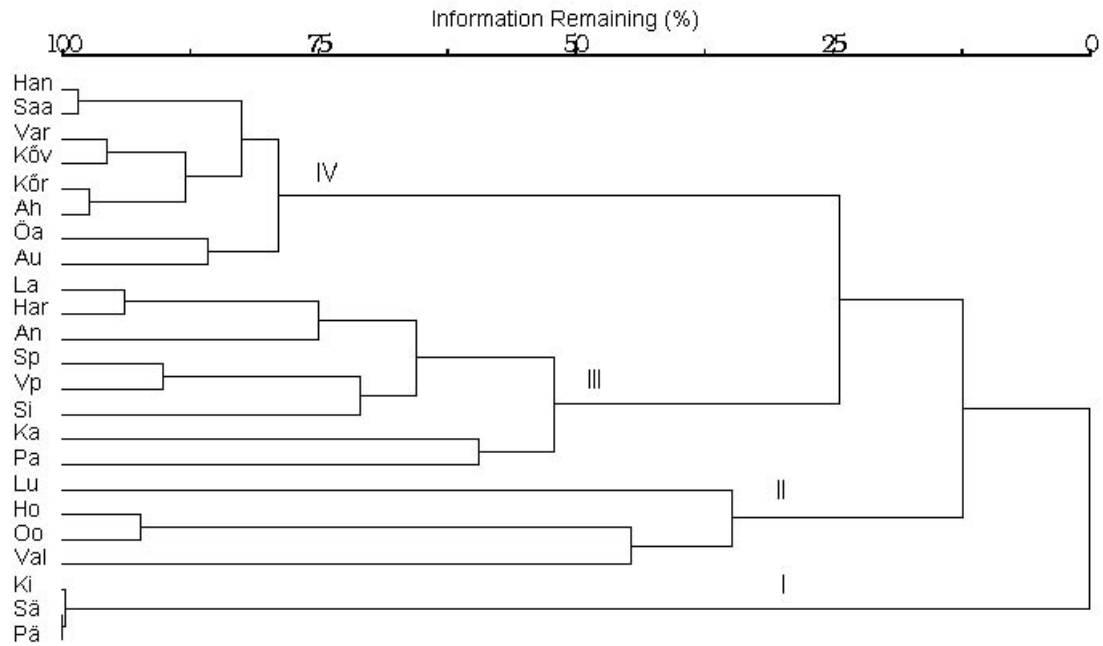

Fig. 2. Similarities of lichen species composition on 23 islets according to cluster analysis. Designations I, II, III and IV indicate the clusters. The abbreviations of the islets see at Table 1.

cia tenella, *Physcia dubia* etc.), sometimes small and hard to identify, are represented on them. The size of these islets varies from 0.1 ha to 1.2 ha. Charcteristic to these islets is shrubbery, with dominance of *Rhamnus cathartica*, *Juniperus communis*, *Ribes alpinus* etc. in central part of the islet. There are only a few small shrubs in Ankrurahu, Kajakarahu, Palgirahu and Sitakare. The shrubbery is more extensive on bigger islets: Langekare, Hanerahu, Väike-Pihlakare and Suur-Pihlakare. The fourth cluster (Hanikatsi, Saarnaki, Vareslaid, Kõverlaid, Kõrgelaid, Ahelaid, Öakse, Auklaid) includes islets where the diversity and number of taxa is the highest (Table 1). The size of these islets ranges from 1.2 ha (Auklaid) to 140 ha (Saarnaki). Variety of biotopes (grasslands, forests, wooded meadows etc.), as well as variety of substrates (different tree species, limestone, granite, wood etc.) characterise these islets. Saxicolous, terricolous, corticolous and lignicolous lichens are all well represented here, although the proportions of them are not equal in each islet. For example, most lignicolous species were found on Hanikatsi and Saarnaki, due to the presence of man-made wooden substrates (wooden windmills, fence posts etc.). Some of these species (*Adelolecia kolaënsis*, *Cyphelium inquinans*, *C. tigillare*) have only a few localities in Estonia. The share of terricolous species is highest in Saarnaki due to human activities (brushwood cutting, sheep pasture).

Although the area of the saltmarsh of Salinõmme is large (231 ha), the total number of species is not high (83). The reed-beds and the coastal meadow dominate (with *Salicornia europae* association) in vegetation. There are pine (*Pinus sylvestris*) and alder forests (*Alnus glutinosa*) at the edges of the saltmarsh. The coastal meadow is periodically inundated by sea-water and therefore the conditions for development of lichen flora are unsuitable. Most of species are epiphytic found in the forests.

CONCLUSIONS

The lichen flora of the Hiiumaa Islets Landscape Reserve is rich in species and interesting within Estonian limits. The number of species (294) as well as the high share of rare species (25%) indicate the eminence of the area. However, the spe-

cies are not uniformly dispersed among islets. Diversity of suitable biotopes and substrates might be the reason for concentration of species on bigger islets. Therefore the destruction of habitats is the most serious threat for lichens. The conservation strategy and land management should provide conditions for persistence of certain substrates (e.g. dead wood, different tree species) as well as variety of biotopes (wooded meadows, grasslands etc.).

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REFERENCES

Alstrup, V. 1993. News on lichens and lichenicolous fungi from the Nordic countries. *Graphis Scripta* 5(2): 96–104.

Brightman, F. H. 1991. New, rare and interesting British lichen records. *Br. Lich. Soc. Bull.* 68: 34–39.

Bruttan, A. 1870. Lichenen Est-, Liv- und Kurlands. *Arch. Naturk. Liv-, Ehst-, u. Kurl.*, Ser. 2, 7: 163–326.

Cole, M. & Hawksworth, D. 2001. Lichenicolous fungi, mainly from the USA, including *Patriciomyces* gen. nov. *Mycotaxon* 77: 305–338.

Culberson, C. F. & Kristinsson, H. 1970. A standardized method for identification of lichen products. *J. Chromatogr.* 46: 85–93.

Diederich, P. 1990. New or interesting lichenicolous fungi 1. Species from Luxembourg. *Mycotaxon* 37: 297–330.

Fröberg, L. 1989. *The calcicolous lichens on the Great Alvar of Öland, Sweden*. Lund. 109 pp.

Hafellner, J. 1996. Bemerkenswerte Funde von Flechten und lichenicole Pilze auf macaronesischen Inseln IV. Einige bisher übersehene lichenicole Arten der kanarischen Inseln. *Cryptogamie*: *Bryol. Lichénol.* 17(1): 1–14.

Hawksworth, D. L. 1979. The lichenicolous Hyphomycetes. *Bull. Br. Mus.* (*Nat. Hist.*) 6(3): 183–300.

Hawksworth, D. L. 1981. The lichenicolous Coelomycetes. *Bull. Br. Mus.* (*Nat. Hist.*) 9(1): 1–98.

Hertel, H. & Rambold, G. 1995. On the genus *Adelolecia* (lichenized *Ascomycotina*, *Lecanorales*). *Biblioth. Lichenol.* 57: 211–230.

Jüriado, I., Lõhmus, P. & Saag, L. 2000. Supplement to the second checklist of lichenized, lichenicolous and allied fungi of Estonia. *Folia Cryptog. Estonica* 37: 21–26.

Jüriado, I., Paal, J. & Liira, J. Epiphytic and epixylic lichen species diversity in Estonian natural forests. *Biodiversity Conserv.* (in press).

Kessel, H. 1961. Über die Entwicklung der Ostsee im Bereich des Territoriums der Estnischen SSR im Holozän (in Estonian). *ENSV TA Geoloogia Instituudi Uurimused*, VII: 167–185.

Kildema, K. & Annuka, E. 1976. How many islands are there in the sea around Estonia? (in Estonian). *Eesti Loodus* 7: 420–430.

Kuusinen, M., Kaipiainen, H., Puolasmaa, A. & Ahti, T. 1995. Threatened lichens in Finland. *Crypt. Bot.* 5: 247–251.

Leito, A. & Leito, T. 1991. *Hiiumaa Islets State Landscape Reserve* (in Estonian). Kärdla. 23 pp.

Luce, J. W. L. 1823. *Prodromus Florae Osiliensis. Topographische Nachrichten von der Insel Oesel*. Riga. 383 pp.

McCune, B. & Mefford, M. J. 1999. *PC-ORD. Multivariate Analysis of Ecological Data, Version 4*. MjM Software Design, Gleneden Beach, Oregon, USA. 237 pp.

Martin, L., Randlane, T. & Martin, J. 2000. Lichens of Vormsi Island. *Folia Cryptog. Estonica* 36: 65–81.

Mägi, M. 1995. *Review of flora and vegetation of Hiiumaa islets* (Ahelaid, Kõverlaid, Kõrgelaid, Vareslaid) (in Estonian). B. Sc. Thesis in Institute of Botany and Ecology, University of Tartu (manuscript).

Mägi, M. 1997. *The flora and vegetation of Hiiumaa islets* (in Estonian). M. Sc. Thesis in Institute of Botany and Ecology, University of Tartu (manuscript).

Nimis, P. L. 1993. *The lichens of Italy. An annotated catalogue*. Museo Regionale di Scienze Naturali Torino, Monografia 12. 897 pp.

Purvis, O. W., Coppins, B. J., Hawksworth, D. L., James, P. W. & Moore, D. M. (eds) 1992. *The lichen flora of Great Britain and Ireland*. Natural History Museum Publications & British Lichen Society, London. 710 pp.

Randlane, T. 1981. Lichens of Vilsandi State Reserve, Estonian S. S. R. (in Russian). *Folia Cryptog. Estonica* 15: 2–5.

Randlane, T. 1984. Lichens of the Island Abruka (Estonian S. S. R.) (in Russian). *Acta et Comm. Univ. Tart.* 662: 28–42.

Randlane, T. 1986. *Analysis of the lichen-flora of the western islands of Estonia* (in Russian). Disser-

tation of candidate degree in University of Tartu (manuscript).
Randlane, T. 1993. Lichens of the Ruhnu island (in Estonian). *Eesti Loodusuur. Seltsi Aastaraamat* 73: 29–39.
Randlane, T. 1998. Samblikud, *Lichens* (*Lichenized Ascomycota*). In *Eesti Punane Raamat* (in Estonian) (ed Lilleleht, V.), pp. 27–35. Eesti Teaduste Akadeemia Looduskaitse Komisjon, Tartu.
Randlane, T. & Saag, A. (eds) 1999. Second checklist of lichenized, lichenicolous and allied fungi of Estonia. *Folia Cryptog. Estonica* 35: 1–132.
Randlane, T., Saag, A. & Suija, A. 2002. Biodiversity of lichenized taxa in Estonia: distribution of rare species. *Biblioth. Lichenol.* 82: 99–109.
Rebassoo, H. 1960. Die Vegetation der Inselchen in der Umgebung von Hiiumaa (in Estonian). *Loodusuur. Seltsi Aastaraamat* 53: 111–130.
Sepp, U. 1970. *The Väinameri Islands* (in Estonian). In *Lääne-Eesti Rannikualade Loodus* (ed Kumari, E.), pp. 26–41. Valgus, Tallinn.
Suija, A. 1998. Lecideoid lichens from Estonia – an annotated checklist. *Folia Cryptog. Estonica* 32: 107–112.
Thor, G. & Arvidsson, L. (eds) 1999. *Rödlistade lavar i Sverige – Artfakta.* ArtDatabanken, SLU, Uppsala. 528 pp.
Timdal, E. 1984. The genus *Hypocenomyce* (*Lecanorales*, *Lecideaceae*), with special emphasis on the Norwegian and Swedish species. *Nord. J. Bot.* 4: 83–108.
Trass, H. & Randlane, T. (eds) 1994. *Macrolichens in Estonia* (in Estonian). Tartu. 399 pp.
Triebel, D. 1989. Lecideicole Ascomyceten. *Biblioth. Lichenol.* 35: 1–278.
Triebel, D., Rambold, G. & Nash, T. H. III. 1991. On lichenicolous fungi from continental North America. *Mycotaxon* 42: 263–296.
Vězda, A. 1969. Neue Taxa und Kombinationen in der Familie *Gyalectaceae* (Lichenisierte Fungi). *Folia Geobot. Phytotaxon.* 4: 443–446.
Zhelnin, G. 1958. Rise of earth's crust in Estonia (in Estonian). *Eesti Loodus* 5: 269–274.
http://www.hiiulaiud.ee. 30. Nov. 2002.

APPENDIX.

The list of lichens, lichenicolous and allied fungi of the Hiiumaa Islets Landscape Reserve.

Frequency classes and symbols are given following Randlane & Saag (1999): rr – very rare (1–2 localities in Estonia); r – rare (3–5); st r – rather rare (6–10); st fq – rather frequent (11–20); fq – frequent (21–50); fqq – very frequent (51 or more localities); # – lichenicolous fungus; + – non-lichenized fungus. Changes in frequency classes of species are indicated with →, new taxa, new frequency classes and new distribution region (WIs – western islands of Estonia) in comparison with Randlane & Saag (1999) and Jüriado et al. (2000) are typed in **bold**.

Abbreviations of islets and the saltmarsh of Salinõmme see at Table 1.

The collector name is presented in brackets, if the specimen was not re-found from earlier studied islets. E. S. – Enel Sander, J. P. – Juhani Pütsepp, T. R. – Tiina Randlane.

Abbreviations of substrates: B – bryophytes, G – granite, L – limestone, W – wood, S – soil, Ace – *Acer platanoides*, Aln – *Alnus glutinosa*, Bet – *Betula* spp., Fra – *Fraxinus excelsior*, Jun – *Juniperus communis*, Lon – *Lonicera xylosteum*, Mal – *Malus domestica*, Pin – *Pinus sylvestris*, Pop – *Populus tremula*, Que – *Quercus robur*, Rha – *Rhamnus cathartica*, Rib – *Ribes alpinum*, Ros – *Rosa* spp., Swi – *Swida sanguinea*, Til – *Tilia cordata*, Ulm – *Ulmus glabra*, Vib – *Viburnum opulus*. Substrates covered with mosses are marked with asterisk (*).

#Abrothallus parmeliarum (Sommerf.) Arnold – rr→**r**; Han; on thallus of *Parmelia* sp.
Acarospora fuscata (Nyl.) Arnold – st fq; Han; G.
A. veronensis A. Massal. – st r→**st fq;** Ah Au Han Kõr Öa Saa Sal Sp; G.
Acrocordia gemmata (Ach.) A. Massal. – fq; Ah Han Kõr Saa Var; Ace Fra Pop Sor Til Ulm.
Adelolecia kolaënsis (Nyl.) Hertel & Rambold – rr→**r**; **WIs**; Han Saa; W.
Amandinea coniops (Wahlenb.) Scheid. & H. Mayrhofer – st r→**st fq**; Au Han Öa Si; G.
A. punctata (Hoffm.) Coppins & Scheid. – fq→**fqq**; Ah Au Han Har Ho Ka Kõr La Öa Pa Saa Sal Si Sp Var Vp; G W Bet Fra Jun Que Rha Sor Til.
Anaptychia ciliaris (L.) Körb. var. ciliaris – fqq; Ah Han Kõr Kõv Saa Var; Fra Lon Pop Que Ulm.

A. ciliaris (L.) Körb. var. melanosticta (Ach.) Boistel – st fq; Saa (leg. T. R.); G.

Anisomeridium biforme (Borrer & Sowerb.) R. C. Harris – rr; Kõv; Jun.

Arthonia byssacea (Weigel) Almq. – st r; Han; Que.

A. radiata (Pers.) Ach. – fq; Ah Han Saa; Fra Til.

A. spadicea Leight. – fq; **WIs**; Kõv; Pin.

Arthopyrenia punctiformis (Pers.) A. Massal. – r→**st r**; Han; Fra Sor.

Aspicilia calcarea (L.) Mudd – st fq; Han Öa Saa; L.

A. cinerea (L.) Körb. – fq; Ah An Han Har Ka Kõr Kõv Saa Sal Sp Var; G.

A. contorta (Hoffm.) Kremp. ssp. hoffmanniana Ekman & Fröberg – fq; Au Han Kõr Öa Saa; L.

A. grisea Arnold – rr; Kõr (leg. T. R.); G.

A. moenium (Vain.) G. Thor & Timdal – st r; Kõr; L.

A. verrucigera Hue – st r; Au Sal; G.

Bacidia arceutina (Ach.) Arnold – fq; Ah Han Kõr Kõv Öa Var Vp; W Bet Jun Pop Ulm Vib.

B. fraxinea Lönnr. – fqq; Han Kõv Var; Lon Pop Ulm.

'B. globulosa' (Flörke) Hafellner & V. Wirth – st fq; Han Kõv Saa Sal Var; W Aln Bet Fra Til Ulm.

B. rubella (Hoffm.) A. Massal. – fq; Ah Han Kõr Kõv Var; Ace Fra Pop Sor.

'B. sabuletorum' (Schreb.) Lettau – fq; Kõv; B*L.

B. subincompta (Nyl.) Arnold – st fq; Ah Kõr Kõv Var; Fra Jun Pop Rha Sor.

Bacidina egenula (Nyl.) Vězda – rr; **WIs**; Kõv; L.

#Bispora christiansenii D. Hawksw. – rr→**r**; **WIs**; Kõv Saa; in apothecia of *Bacidia globulosa* and *Amandinea punctata*.

#B. lichenum Diederich – rr; **WIs**; Sal; in apothecia of *Lecania cyrtella*.

Bryoria fuscescens (Gyeln.) Brodo & D. Hawksw. – fqq; Han Saa Sal; W Bet Jun.

Buellia disciformis (Fr.) Mudd – fqq; Han Saa Sal; Aln Bet Que Sor Til.

B. erubescens Arnold – st fq; Au; Jun.

B. griseovirens (Turner & Borrer ex Sm.) Almb. – fqq; Ah Au Han Kõr Kõv Öa Saa Sal Var; W Aln Bet Fra Jun Pin Que Sor Ulm.

Calicium abietinum Pers. – fqq; Han Sal; Pin, on thatch.

C. glaucellum Ach. – fqq; Han; W.

C. salicinum Pers. – fq; Han Kõv; Que Sor.

C. viride Pers. – fqq; Han; Que.

Caloplaca cerina (Ehrh. & Hedw.) Th. Fr. – fqq; Ah Sal; Pin Vib.

C. chlorina (Flot.) Sandst. – st r; Au Har Kõr; G W.

C. citrina (Hoffm.) Th. Fr. – fq; Ah An Au Han Har Kõr La Öa Pa Saa Sal Val; W G L.

C. crenularia (With.) J. R. Laundon – rr; **WIs**; Au Öa; G.

C. flavorubescens (Huds.) J. R. Laundon – fqq; Ah Han Kõr Kõv Öa Sal Var; Fra Lon Pin Pop Rha.

C. holocarpa (Hoffm. ex Ach.) A. E. Wade – fq; Ah Au Har Kõr La Öa Pa Saa; G L.

C. lactea (A. Massal.) Zahlbr. – fq; Han Saa; L.

C. saxicola (Hoffm.) Nordin – fq; Han Saa; L.

C. scopularis (Nyl.) H. Magn. – st fq→**fq**; Ah An Au Han Ho Ka Ki Kõr La Oo Pä Sä Sp Vp; G.

C. sinapisperma (Lam. & DC.) Maheu & Gillet – st fq; Saa; B*S.

C. vitellinula auct. – st fq; Saa; L.

Candelariella aurella (Hoffm.) Zahlbr. – fq; Han Har Saa Var; L.

C. coralliza (Nyl.) H. Magn. – fq; Ah Au Han Har Ka Kõr Öa Saa Sal; G.

C. vitellina (Hoffm.) Müll. Arg. – fq; Ah Au Han Kõr Kõv Öa Saa Sal Var; G.

C. xanthostigma (Ach.) Lettau – fq; Han Kõr Saa Sal; Fra Que.

Catillaria chalybeia (Borrer) A. Massal. – r→**st fq**; Au Kõr Kõv Saa Sal Var; G.

Catinaria atropurpurea (Schaer.) Vězda & Poelt – rr; **WIs**; Ah; Sor.

#Cercidospora epipolytropa (Mudd) Arnold – rr→**r**; **WIs**; Kõr Sal Var; on apothecia of *Lecanora polytropa*.

Cetraria aculeata (Schreb.) Fr. – fqq; Han Saa; S.

C. ericetorum Opiz – fqq; Saa; S.

C. islandica (L.) Ach. – fqq; Han Kõv Öa Saa Var; S.

'C. sepincola' (Ehrh.) Ach. – fqq; Ah Han Kõv Öa Saa Sal Var; W Aln Bet Jun Mal Pin.

Chaenotheca chrysocephala (Turner ex Ach.) Th. Fr. – fqq; Ah Han Sal; W Bet Pin Que.

C. ferruginea (Turner & Borrer) Mig. – fqq; Kõv Sal Var; Pin.

C. trichialis (Ach.) Th. Fr. – fqq; Ah Han Sal; Bet Pin Que.

+Chaenothecopsis pusilla (Ach.) A. F. W. Schmidt – fq; Han; Que.

Chrysotrix candelaris (L.) J. R. Laundon – fq; Han Sal; W Que.

C. CHRYSOPHTHALMA (P. James) P. James & J. R. Laundon – rr; Han; Que.
CLADINA ARBUSCULA (Wallr.) Hale & W. L. Culb. – fqq; Saa; S.
C. CILIATA (Stirt.) Trass f. TENUIS (Flörke) Ahti – fq; Saa; S.
C. MITIS (Sandst.) Hustich – fqq; Saa Var; S.
C. RANGIFERINA (L.) Nyl. – fqq; Han Kõv Öa Saa Var; S.
CLADONIA BOREALIS S. Stenroos – st fq; Saa (leg. E. S. & T. R.); S.
C. BOTRYTES (K. G. Hagen) Willd. – fqq; Öa Saa; W.
C. CARIOSA (Ach.) Spreng. – fqq; Saa; S.
C. CENOTEA (Ach.) Schaer. – fqq; Han Saa Var; W B*G.
C. CHLOROPHAEA (Flörke ex Sommerf.) Spreng. – fqq; Han Kõr Öa Saa Var; S B*G B*Til.
C. COCCIFERA (L.) Willd. – st fq; Saa; S.
C. CONIOCRAEA (Flörke) Spreng. – fqq; Han Kõr Öa Saa Sal Var; W Jun Pin Pop B*G.
C. CRISPATA (Ach.) Flot. – fqq; Saa; W.
C. DEFORMIS (L.) Hoffm. – fqq; Saa; B*G.
C. DIGITATA (L.) Hoffm. – fqq; Au Han Öa Sal; W Jun Que.
C. FIMBRIATA (L.) Fr. – fqq; Ah Au Han Kõr Kõv Öa Saa Sal Var; S W Bet Jun Que Sor B*G.
C. FOLIACEA (Huds.) Willd. – st fq; Öa Saa; S.
C. FURCATA (Huds.) Schrad. – fqq; Han Kõr Saa Var; S W.
C. GRACILIS (L.) Willd. ssp. GRACILIS – fq; Öa Saa; S Jun.
C. MACILENTA Hoffm. – fqq; Han Kõr Saa Sal; W B*G.
C. OCHROCHLORA Flörke – fq; Kõv Var; W B*G.
C. POCILLUM (Ach.) Grognot – st fq; Han Öa Saa; S.
C. PYXIDATA (L.) Hoffm. – fqq; Han Kõr Saa; S B*G.
C. RANGIFORMIS Hoffm. – fq; Ah Öa Saa; S.
C. SQUAMOSA Hoffm. – fqq; Sal; S.
C. SUBRANGIFORMIS Sandst. – fq; Ah Kõr Kõv Saa Var; S.
C. SUBULATA (L.) F. H. Wigg – fqq; Öa; B*G.
C. SYMPHYCARPA (Flörke) Fr. – fq; Han Var; S.
CLAUZADEA MONTICOLA (Schaer.) Hafellner & Bellem. – fq; Kõr Öa; L.
CLIOSTOMUM GRIFFITHII (Sm.) Coppins – st fq; Kõv Öa Sal; W Bet Jun.
COLLEMA FUSCOVIRENS (With.) J. R. Laundon – fq; Au Öa Saa; L.
CYPHELIUM INQUINANS (Sm.) Trevis. – st r; Han; W.
C. TIGILLARE (Ach.) Ach. – r→**st r**; Han; W.
DIMERELLA PINETI (Ach.) Vězda – fq; Ah Han Kõr Kõv Öa Sal Var; W Aln Bet Pin Que Ulm.
DIPLOTOMMA ALBOATRUM (Hoffm.) Flot. – st fq; Saa; L.
D. VENUSTUM Körb. – r; Han Kõr (leg. T. R.); L.
#ENDOCOCCUS PERPUSILLUS Nyl. – r; **WIs**; Au Han Kõv Öa; on thallus of *Rhizocarpon distinctum* and *R. polycarpon*.
#E. PROPINQUUS (Körb.) D. Hawksw. – rr; **WIs**; Saa; on thallus of *Verrucaria nigrescens*.
#E. RUGULOSUS (Körb.) D. Hawksw. – rr; **WIs**; Han (leg. E. S.); on thallus of *Aspicilia cinerea*.
EVERNIA PRUNASTRI (L.) Ach. – fqq; Ah Au Han Kõr Kõv Öa Saa Sal Var; Aln Bet Fra Jun Lon Mal Pin Pop Que Rha Rib Til Ulm Vib.
FLAVOCETRARIA NIVALIS (L.) Kärnefelt & A. Thell – fqq; Saa; S.
GRAPHIS SCRIPTA (L.) Ach. – fqq; Han Var; Bet Fra Sor Til.
GYALECTA SUBCLAUSA Anzi – rr; **WIs**; Kõv; L.
HAEMATOMMA OCHROLEUCUM (Neck.) J. R. Laundon var. OCHROLEUCUM – st fq; Ah Han Saa Sal Var; G Aln Fra Que Sor Til.
H. OCHROLEUCUM (Neck.) J. R. Laundon var. PORPHYRIUM (Pers.) J. R. Laundon – st r; Han; Til.
HYPOCENOMYCE CARADOCENSIS (Leight. ex Nyl.) P. James & Gotth. Schneid. – st r; Han; W.
H. FRIESII (Ach.) P. James & Gotth. Schneid. – st fq; Han; W.
H. PRAESTABILIS (Nyl.) Timdal – rr; **WIs**; Saa; W.
H. SCALARIS (Ach.) M. Choisy – fqq; Ah Han Kõv Saa Sal; W Bet Pin.
H. SOROPHORA (Vain.) P. James & Poelt – fq; Han; W.
HYPOGYMNIA FARINACEA Zopf – fq; Han Sal; Jun Pin.
H. PHYSODES (L.) Nyl. – fqq; Ah Au Han Kõr Kõv Öa Saa Sal Var Vp; G Aln Bet Fra Jun Mal Pin Pop Rha Rib Ros Que Sor Til Vib Ulm B*G.
H. TUBULOSA (Schaer.) Hav. – fqq; Au Han Öa Saa Sal; W Jun Mal Pin.
IMSHAUGIA ALEURITES (Ach.) S. L. F. Meyer – fqq; Han Sal; W Pin.
#KARSTENIOMYCES PELTIGERAE (P. Karst.) D. Hawksw. – r; Kõr (leg. T. R.); on thallus of *Peltigera* sp.
#LAEVIOMYCES PERTUSARIICOLA (Nyl.) D. Hawksw. – rr; **WIs**; Saa; on thallus *Pertusaria pertusa*.
LECANIA CYRTELLA (Ach.) Th. Fr. – fq; Ah Han Öa Sal Var; Fra Pin Pop Sor Ulm.
L. ERYSIBE (Ach.) Mudd – r→**st r**; La Öa Sp Val Var; L.

L. fuscella (Schaer.) A. Massal. – st r; Sal; Pin.
L. naegelii (Hepp) Diederich & Boom – fq; Kõv Öa Sal; Pin Pop Ulm.
L. rabenhorstii (Hepp) Arnold – r; Han; L.
Lecanora albescens (Hoffm.) Branth & Rostr. – fqq; Ah An Au Han Kõr La Öa Pa Saa Vp; L.
L. andrewii de Lesd. – **st fq**; **WIs**; Ah An Au Han Har Kõr La Lu Öa Sal Sp; G Rha.
L. argentata (Ach.) Malme – fqq; Han Kõr Saa Var; Fra Que Til.
L. cadubriae (A. Massal.) Hedl. – st r; Sal; Pin.
L. caesiosora Poelt – rr; Saa (leg. T. R.); G.
L. carpinea (L.) Vain. – fqq; Ah Au Han Har Kõr Kõv La Öa Saa Si Var Vp; Aln Bet Fra Jun Que Pop Rha Rib Sor Vib.
L. cenisia Ach. – fq; Ah Au Han Kõr Saa Var Vp; G.
L. chlarotera Nyl. – fqq; Ah Au Han Har Kõr Kõv La Öa Saa Si Sp Var Vp; Aln Bet Fra Jun Lon Que Pop Que Rha Sor Swi Til Ulm Vib.
L. conizaeoides Nyl. ex Cromb. – st fq; Han Saa Val; W Jun.
L. crenulata Hook. – st fq; Au Han Öa Saa; L.
L. dispersa (Pers.) Sommerf. – fqq; Han Har Saa Var; L.
L. expallens Ach. – fq; Han Sal; W Que Pin.
L. hagenii (Ach.) Ach. – fqq; Ah An Han Har Kõr Kõv La Öa Pa Saa Sal Si Var; W Jun Pin Rha Ros Sor Swi Vib.
L. helicopis (Wahlenb.) Ach. – st fq→**fq**; Ah An Kõr La Lu Pa Sp; G.
L. intricata (Ach.) Ach. – st fq; Han Kõr Kõv Öa Saa; G.
L. intumescens (Rebent.) Rabenh. – st r; Saa (leg. E. S.); on deciduous tree.
L. leptyrodes (Nyl.) Degel. – fqq; Ah Au Han Kõr Kõv La Saa Var; Fra Pop Rha Swi Ulm Vib.
L. muralis (Schreb.) Rabenh. – fqq; Ah Au Han Har Ka Kõr Kõv La Öa Pa Saa Sal Si Sp Var Vp; G.
L. phaeostigma (Körb.) Almb. – st fq; Han; Pin.
L. piniperda Körb. – r; **WIs**; Sal; Pin.
L. polytropa (Ehrh. ex Hoffm.) Rabenh. – fq; Ah Han Kõr Kõv Öa Pa Saa Sal Var; G.
L. populicola (DC.) Duby – fq; Han; Pop.
L. pulicaris (Pers.) Ach. – fqq; Ah Au Han Har Kõv Öa Pa Saa Sal Var Vp; W Aln Bet Jun Pin Rha Sor Ulm Vib.
L. rugosella Zahlbr. – fqq; Han Kõr Saa; Fra Pop Sor.
L. rupicola (L.) Zahlbr. – fq; Ah Au Han Har Kõr Kõv La Öa Pa Saa Sp Var Vp; G.
L. saligna (Schrad.) Zahlbr. – fq; Han Kõr Sal; W Rha.
L. strobilina (Spreng.) Kieff. – st fq; Han; W.
L. sulphurea (Hoffm.) Ach. – fq; Ah Han Kõr Kõv Öa Pa Saa Sp Var; G.
L. symmicta (Ach.) Ach. – fqq; Ah Au Han Kõr Kõv Öa Saa Sal Var Vp; W Jun Pin Rha Ros Sor Ulm.
L. varia (Hoffm.) Ach. – fqq; Au Han Kõv Saa Sal; W Aln Bet Jun Sor.
Lecidea fuscoatra (L.) Ach. – st fq; Ah Han Kõr Öa Saa Sal Var; G.
'L. hypopta' Ach. – rr→**r**; Sal Var; W Pin.
L. lapicida (Ach.) Ach. var. lapicida – st r; Kõr (leg. T. R.); G.
L. lapicida (Ach.) Ach. var. pantherina Ach. – st fq→**fq**; Au Han Ka Kõr Öa Pa Saa Var; G.
'L. nylanderi' (Anzi) Th. Fr. – fqq; Ah; Rha.
Lecidella carpathica Körb. – rr→**r**; Ah Au Kõr (leg. T. R.) Öa; G.
L. elaeochroma (Ach.) M. Choisy – fqq; Ah An Au Han Har Ka Kõr Kõv La Öa Pa Saa Sal Si Sp Var Vp; W Ace Bet Fra Jun Lon Pin Pop Que Rha Rib Sor Til Ulm Vib.
L. euphorea (Flörke) Hertel – fqq; Ah Var; Fra Pop Vib.
L. scabra (Taylor) Hertel & Leuckert – rr→**r**; Han Öa; G L.
L. stigmatea (Ach.) Hertel & Leuckert – fq; Ah Han Kõr La Öa Pa Saa Var; G L.
L. subviridis Tønsberg – rr; **WIs**; Vp; Jun.
Lepraria elobata Tønsberg – st r; Han; G.
L. incana (L.) Ach. – fqq; Ah Han Kõr Kõv Öa Saa Sal Var; G W Aln Bet Jun Pin Pop Que Rha.
L. jackii Tønsberg – fq; Kõr Öa Sal; G Jun Pin.
L. lobificans Nyl. – fq; Han Var; B*G B*Til.
L. neglecta (Nyl.) Erichsen – r→**st fq**; Han Kõr Kõv Saa (leg. E. S.) Var; G.
Leptogium lichenoides (L.) Zahlbr. – st fq→**fq**; Saa Var; S.
L. subtile (Schrad.) Torss. – r→**st r**; Han Öa; S.
#Lichenoconium lecanorae (Jaap) D. Hawksw. – rr→**r**; **WIs**; Saa Var; on apothecia of *Lecanora carpinea* and *L. leptyrodes*.
#L. pyxidatae (Oudem.) Petr. & Sydow – **rr**; **WIs**; Saa; on podetia of *Cladonia pyxidata*.
#L. xanthoriae M. S. Christ – rr→**r**; Han; on *Xanthoria polycarpa*.
Melanelia exasperata (De Not.) Essl. – fq; Ah Au Han Kõv Öa Saa Sp Var Vp; Bet Jun Fra Mal Pop Que Rha Sor Til Vib.

M. EXASPERATULA (Nyl.) Essl. – fqq; Han Har Saa Sal; Aln Bet Fra Que Rha.

M. FULIGINOSA (Fr. ex Duby) Essl. – fqq; Ah Au Han Kõr Kõv Öa Pa Saa Sp Var; G Fra Mal Pop Que Rha Rib Vib.

M. OLIVACEA (L.) Essl. – fqq; Han Kõv Saa Sal Var; Aln Bet Pin.

M. SUBARGENTIFERA (Nyl.) Essl. – fq; Han (leg. E. S. & T. R.); Til.

M. SUBAURIFERA (Nyl.) Essl. – fqq; Ah Han Kõr Kõv Saa Var; Bet Fra Rha Sor.

MICAREA DENIGRATA (Fr.) Hedl. – st fq; Au Han Sal; W Jun Pin.

M. MISELLA (Nyl.) Hedl. – r→**st r**; Saa; W.

M. PRASINA Fr. – fqq; Ah Han Saa Sal Var; W Bet Pin.

#MICROCALICIUM DISSEMINATUM (Ach.) Vain. – st fq; Han; W.

#MUELLERELLA HOSPITANS Stizenb. – r→**st r**; Han Kõv; on apothecia of *Bacidia fraxinea* and *B. rubella*.

#M. LICHENICOLA (Sommerf. : Fr.) D. Hawksw. – **r**; **WIs**; Ah Au Han; on *Lecidella stigmatea, Verrucaria muralis* and *Caloplaca* sp.

#M. PYGMAEA (Körb.) D. Hawksw. var. PYGMAEA – **r**; **WIs**; Öa Var; on *Lecidea fuscoatra* and *L. lapicida* var. *pantherina*.

MYCOBILIMBIA CARNEOALBIDA (Müll. Arg.) comb. ined. – st fq; Kõv; B*L.

MYCOBLASTUS FUCATUS (Stirt.) Zahlbr. – st fq; Kõv; Pop.

+MYCOCALICIUM SUBTILE (Pers.) Szatala – fqq; Han Sal; W.

+MYCOMICROTHELIA CONFUSA D. Hawksw. – rr→**r**; **WIs**; Han; Til.

NEOFUSCELIA LOXODES (Nyl.) Essl. – fqq; Ah Han Kõr Öa Pa Saa; G W.

N. PULLA (Ach.) Essl. – fqq; Ah Au Han Ho Ka Kõr Kõv Öa Pa Saa Sal Var; G.

NEPHROMA PARILE (Ach.) Ach. – st fq; Kõr; B*Fra.

OCHROLECHIA ANDROGYNA (Hoffm.) Arnold – fqq; Han Saa; W.

O. MICROSTICTOIDES Räsänen – fq; Sal; Pin.

OPEGRAPHA RUFESCENS Pers. – fq; Ah Han Kõr Var; Ace Bet Fra Pop Til.

O. VARIA Pers. – fq; Han Saa; Ace Que Til.

O. VULGATA Ach. – st fq; Han; Til.

PARMELIA SAXATILIS (L.) Ach. – fqq; Ah Au Han Ka Kõr Öa Pa Saa Var; G Bet Jun Pin Que Rha.

P. SULCATA Taylor – fqq; Ah Au Han Ka Kõr Kõv Öa Pa Saa Sal Si Sp Var Vp; W Aln Bet Fra Jun Lon Mal Que Pin Pop Rha Rib Sor Swi Til Ulm Vib B*G.

PARMELIOPSIS AMBIGUA (Wulfen) Nyl. – fqq; Au Han Kõv Öa Saa Sal Var; W Bet Jun Pin.

P. HYPEROPTA (Ach.) Arnold – fq; Saa (leg. E. S.); Jun.

PELTIGERA APHTHOSA (L.) Willd. – fqq; Saa; S.

P. CANINA (L.) Willd. – fqq; Ah Han Kõr Kõv Öa Saa Var; S B*G B*Til.

P. COLLINA (Ach.) Schrad. – r; Han; B*Til.

P. HORIZONTALIS (Huds.) Baumg. – st fq; Ah Han; B*G.

P. MEMBRANACEA (Ach.) Nyl. – st fq; Han; B*G.

P. NECKERI Hepp ex Müll. Arg. – fq; Saa; S.

P. POLYDACTYLA (Neck.) Hoffm. – fqq; Kõr Öa; S Fra.

P. PRAETEXTATA (Flörke ex Sommerf.) Zopf – fqq; Ah Han Kõr Var; Sor B*G B*Pop.

P. RUFESCENS (Weiss) Humb. – fqq; Han Kõv Saa Var; S B*L.

PERTUSARIA ALBESCENS (Huds.) M. Choisy – fqq; Han Kõv Saa; Ace Pop.

P. AMARA (Ach.) Nyl. – fqq; Ah Han Saa; W Fra Pop Que.

P. COCCODES (Ach.) Nyl. – fqq; Han; Ace Que.

P. LEIOPLACA DC. – fq; Ah Han Kõr; Ace Fra Que Til.

P. PERTUSA (Weigel) Tuck. – st fq; Saa; Til.

PHAEOPHYSCIA ORBICULARIS (Neck.) Moberg – fqq; Ah Ka Kõr Kõv Saa Sal; G L Aln Fra Lon Pop Til.

PHLYCTIS ARGENA (Spreng.) Flot. – fqq; Ah Au Han Kõr Kõv Pa Saa Sal Var; Ace Aln Bet Fra Jun Pin Pop Que Sor Til Ulm Vib.

PHYSCIA ADSCENDENS (Fr.) H. Olivier – fqq; Ah Au Han Har Kõr La Öa Saa Sal Sp Var; W Aln Bet Fra Jun Lon Mal Pop Que Rha Rib Ulm Vib.

P. AIPOLIA (Ehrh. ex Humb.) Fürnr. – fqq; Kõv Var; Lon Rha.

P. CAESIA (Hoffm.) Fürnr. – fqq; Ah Au Han Ho Ka Kõr Kõv Oo Öa Saa Sal Var; G L.

P. DUBIA (Hoffm.) Lettau – fqq; Au Han Har Kõr Si Val Vp; G W Fra Jun Rha.

P. STELLARIS (L.) Nyl. – fqq; Ah An Au Han Har Ka Kõr Kõv La Öa Saa Si Sp Var; Bet Fra Jun Mal Pop Que Rha Rib Ros Sor Swi Ulm Vib.

P. TENELLA (Scop.) DC. var. MARINA (E. Nyl.) Lynge – fq; Han Ho Ka Oo Saa Sp Val Vp; G.

P. TENELLA (Scop.) DC. var. TENELLA – fqq; Ah Au Han Har Kõr Kõv La Öa Pa Saa Sal; Aln Bet

Fra Jun Lon Pin Pop Que Rha Rib Sor Swi Til Ulm Vib.

Physconia distorta (With.) J. R. Laundon – fqq; Ah Han Kõr Kõv Saa Var; G Fra Lon Pop Que Ulm.

P. enteroxantha (Nyl.) Poelt – fqq; Ah Han Saa; Bet Fra Que.

P. perisidiosa (Erichsen) Moberg – fq; Han Var; Fra Que Til.

Placynthiella dasaea (Stirt.) Tønsberg – r→**st r**; Han Saa Sal; W.

P. icmalea (Ach.) Coppins & P. James – fqq; Han Öa Saa; W Jun.

Placynthium nigrum (Huds.) Gray – fq; Kõr Saa; L.

Platismatia glauca (L.) W. L. Culb. & C. F. Culb. – fqq; Ah Han Öa Saa Sal Var; W Aln Bet Jun Pin.

Polyblastia albida Arnold – rr→**r**; Au Kõr (leg. T. R.); L.

#Polycoccum pulvinatum (Eitner) R. Sant. – rr→**r**; **WIs**; Au Sal; on thallus of *Physcia caesia*.

Porina chlorotica (Ach.) Müll. Arg. – rr; Kõr; G.

Porpidia tuberculosa (Sm.) Hertel & Knoph – r; Kõv; G.

Protoblastenia rupestris (Scop.) J. Steiner – fq; Han Var; L.

Protoparmelia badia (Hoffm.) Hafellner – st fq; Saa; G.

Pseudevernia furfuracea (L.) Zopf – fqq; Ah Han Kõr Kõv Öa Saa Sal Var; W Aln Jun Pin Rha Rib.

Psilolechia lucida (Ach.) M. Choisy – st r; Han; G.

Pyrrhospora quernea (Dicks.) Körb. – st fq→**fq**; Han Öa Sal; Jun Que.

Ramalina farinacea (L.) Ach. – fqq; Ah Au Han Kõr Kõv Öa Saa Sal Var; Aln Bet Fra Jun Lon Pop Que Rha Rib Sor Til Ulm.

R. fastigiata (Pers.) Ach. – fqq; Ah Au Han Kõr Kõv Öa Saa; Aln Bet Fra Jun Pop Que Rha Sor Til Ulm.

R. fraxinea (L.) Ach. – fqq; Ah An Au Han Har Ka Kõr Kõv Öa Saa Si Sp Var Vp; Bet Fra Jun Pop Que Rha Sor Til Ulm.

R. polymorpha (Lilj.) Ach. – fq; Saa; G.

R. subfarinacea (Nyl. ex Cromb.) Nyl. – st r; Öa; G.

#Ramboldia insidiosa (Th. Fr.) Hafellner – st r; Au Han; W on thallus of *Lecanora varia*.

Rhizocarpon distinctum Th. Fr. – st fq; Ah Au Han Ho Kõr Kõv Öa Pa Saa Sal Var; G.

R. geographicum (L.) DC. – st fq; Au Han Kõr Öa Saa; G.

R. grande (Flörke ex Flot.) Arnold – rr; Saa (leg. T. R.); G.

R. macrosporum Räsänen – r→**st r**; Au; G.

R. polycarpum (Hepp) Th. Fr. – r→**st fq**; Han Kõr Öa Saa (leg. E. S.) Sal Var; G.

#Rimularia furvella (Nyl. ex Mudd) Hertel & Rambold – r→**st r**; Au Kõr (leg. T. R.) Öa Saa (leg. J. P.); on thallus of *Lecidea fuscoatra*, *L. lapicida* var. *lapicida*, *Lecidella carpathica* etc.

#R. insularis (Nyl.) Hertel & Rambold – st fq→**fq**; Au Han Kõr Kõv Öa Saa; on thallus of *Lecanora rupicola*.

Rinodina cacuminum (Th. Fr.) Malme – r→**st r**; Han Kõr Sp Var; G.

R. confragosa (Ach.) Körb. – r→**st r**; Au Saa (leg. J. P.) Vp; G.

R. exigua Gray – fq, Au Han; W.

R. gennarii Bagl. – st r→**st fq**; Ah An Han Har Lu Oo Saa (leg. J. P.); G.

R. immersa (Körb.) Arnold – st r→**st fq**; Au Han Pa Saa; L.

R. pyrina (Ach.) Arnold – fq; **WIs**; Au La; Rha Ros.

R. sophodes (Ach.) A. Massal. – fq; Au Han Har Öa Saa Si Sp Var Vp; Bet Jun Fra Rha Sor.

Ropalospora viridis (Tønsberg) Tønsberg – r; **WIs**; Han; G.

Sarcogyne regularis Körb. – st fq; Kõv; L.

Schaereria fuscocinerea (Nyl.) Clauzade & Cl. Roux – st r→**st fq**; Ah Han Kõv Öa Saa (leg. J. P.) Var; G.

Schismatomma percileum (Ach.) Branth & Rostr. – st r→**st fq**; Han; Ace Que.

Sclerophora nivea (Hoffm.) Tibell – st fq; Han; Que.

Scoliciosporum chlorococcum (Stenh.) Vězda – fq; Au Han Öa Sal Var; W Bet Jun Pin Vib.

S. umbrinum (Ach.) Arnold – st r→**st fq**; Ah Han Saa Var; G.

#Sphaerellothecium propinquellum (Nyl.) Roux & Triebel – st r; **WIs**; Han Kõv Var; on apothecia of *Lecanora carpinea* and *L. leptyrodes*.

#Sphinctrina turbinata (Pers. : Fr.) De Not. – rr; Saa (leg. E. S.); on thallus of *Pertusaria pertusa*.

Strangospora moriformis (Ach.) Stein – r; Han; W.

#Taeniolella delicata M. S. Christ. & D. Hawksw. – **rr**; **WIs**; Si; in apothecia of *Amandinea punctata*.

Tephromela atra (Huds.) Hafellner ex Kalb – fqq; Ah Au Han Ho Ka Kõr Kõv La Öa Saa Var Vp; G Pop.

Thelomma ocellatum (Körb.) Tibell – r; Han; W.

Trapeliopsis flexuosa (Fr.) Coppins & P. James – fq; Han Öa Saa Sal; W Jun.

#Tremella cladoniae Diederich & M. S. Christ. – rr; **WIs;** Sal; on thallus of *Cladonia* sp.

Tremolecia atrata (Ach.) Hertel – r; Öa; G.

Tuckermannopsis chlorophylla (Willd.) Hale – fqq; Han Öa Saa Sal Var; W Bet Jun Pin.

Umbilicaria deusta (L.) Baumg. – fqq; Han Kõv Öa Saa; G.

U. polyphylla (L.) Baumg. – fqq; Au Han Kõr Kõv Saa; G.

U. torrefacta (Lightf.) Schrad. – st fq; Han Kõr; G.

Usnea filipendula Stirt. – fqq; Ah; Jun.

U. hirta (L.) F. H. Wigg. – fqq; Han Saa Sal; W Jun Pin.

U. subfloridana Stirt. – fqq; Saa Sal; W.

Verrucaria calciseda DC. – st r; Han Kõr; L.

V. fuscella (Turner) Winch – r; Pa; L.

V. glaucina auct. – r→**st r**; Ah Au Han; L.

V. maura Wahlenb. – st r→**st fq**; An Har Ho Ki Oo Pä Sä Sp Vp; G.

V. muralis Ach. – fq; Ah Au Han Kõv Öa Saa Val Var; L.

V. nigrescens Pers. – fq; Ah Au Han Kõr La Öa Saa Var; L.

#Vouauxiella lichenicola (Linds.) Petr. & Sydow – fq; **WIs**; Han Kõr Kõv Saa Sp; on apothecia of *Lecanora chlarotera*.

#Vouauxiomyces ramalinae (Nordin) D. Hawksw. – st fq; Saa; on apothecia of *Ramalina fraxinea*.

Vulpicida pinastri (Scop.) J.-E. Mattsson & M. J. Lai – fqq; Han Öa Saa Sal; W Jun Pin.

Xanthoparmelia conspersa (Ach.) Hale – fqq; Ah Au Han Kõr Kõv Öa Pa Saa Var; G.

X. somloënsis (Gyeln.) Hale – fq; Ah Han Kõv Saa; G.

Xanthoria candelaria (L.) Th. Fr. – fqq; Ah Au Han Har Ho Ka Kõr La Öa Saa Sal Sp Var Vp; G W.

X. fulva (Hoffm.) Poelt & Petutschnig – st r; Han; Que.

X. parietina (L.) Th. Fr. – fqq; Ah An Au Han Har Ho Ka Kõr Kõv La Lu Oo Öa Pa Saa Sal Si Sp Val Var Vp; G W Aln Bet Fra Jun Lon Que Pin Pop Rha Rib Sor Swi Vib.

X. polycarpa (Hoffm.) Th. Fr. ex Rieber – fqq; Ah An Au Han Har Kõr Kõv La Öa Pa Saa Sal Si Var Vp; Bet Fra Jun Mal Pin Que Rha Rib Ros Sor Swi Til Ulm Vib.

#Zwackhiomyces coepulonous (Norman) Grube & R. Sant. – rr; Saa; on thallus of *Caloplaca saxicola*.

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Lichenicolous fungi from the Kandalaksha Gulf, Karelia Keretina, Russia

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Abstract: Thirty eight species of lichenicolous fungi are reported from the Kandalaksha Gulf of the White Sea, Karelia Keretina, Russia. *Chionosphaera* cf. *apobasidialis*, *Karsteniomyces peltigerae*, *Lichenochora* cf. *polycoccoides*, *Lichenoconium xanthoriae*, *Odontotrema rhizocarpicola*, *Phoma cytospora*, *Plectocarpon cladoniae*, *Sphaerellothecium conioides*, *Stigmidium* cf. *mitchellii*, *Stigmidium pumilum*, and *Xenonectriella ornamentata*, are new to Russia. Another 17 fungi are new to Karelia.

Kokkuvõte: Kandalakša lahe ümbruse (Karjala) lihhenikoolsed seened.

Teatatakse 38-st lihhenikoolse seene liigist Valge mere Kandalakša lahe ümbrusest. *Chionosphaera* cf. *apobasidialis*, *Karsteniomyces peltigerae*, *Lichenochora* cf. *polycoccoides*, *Lichenoconium xanthoriae*, *Odontotrema rhizocarpicola*, *Phoma cytospora*, *Plectocarpon cladoniae*, *Sphaerellothecium conioides*, *Stigmidium* cf. *mitchellii*, *Stigmidium pumilum* ja *Xenonectriella ornamentata* on Venemaa esmasleiud. Ülejäänud 17 seeneliiki on uued Karjala jaoks.

INTRODUCTION

This paper continues the series dealing with lichenicolous fungi of Russia (Zhurbenko & Santesson, 1996; Zhurbenko & Hafellner, 1999; Zhurbenko & Davydov, 2000; Zhurbenko & Pospelova, 2001; Zhurbenko, 1998, 2000, 2001; Zhurbenko & Otnyukova, 2001).

In 1997–2001 the junior author studied the lichen flora of Keret' Archipelago (66°13–21' N, 33° 33–55' E), located in the Kandalaksha Gulf of the White ("Beloe") Sea, Karelia Republic of Russia (Fig. 1). Concomitantly he collected some lichenicolous fungi, which were identified later by the senior author. The archipelago consists of more than 40 islands, total square of which is about 55 sq. km. According to the biogeographical subdivision of Karelia (Cajander, 1906; Fadeeva et al., 1997), the study area belongs to the Karelia Keretina biogeographical province, it also falls within the northern taiga subzone of taiga zone (Tsinzerling, 1934; Anonymous, 1980). The vegetation cover is mostly represented by different types of sparse pine (Pinus sylvestris L.) forests. Mixed forests of Picea abies (L.) Karst., P. obovata Ledeb., Pinus sylvestris, Populus tremula L., Betula pendula Roth., B. pubescens Ehrh. also play an important role in the area. A number of small islands exhibit a special type of tundra-like vegetation – treeless dwarf-shrub heaths ("ludy"). Extensive rock outcrops are common in the area, particularly on the coastal slopes. The study area falls within the White Sea (Karelian Coast) climatic region as recognized by Atlas of the Karelian ASSR (Anonymous, 1989). The temperature ranges from a mean minimum of -11 °C in January to +14 °C in July. The mean annual amount of precipitation is 500 mm.

MATERIAL AND METHODS

The study is almost exclusively based on materials collected in the Keret' Archipelago of the Kandalaksha Gulf. However one additional specimen from the adjacent island of the gulf was also treated. Macroscopic features were examined with a LOMO dissecting Stereomicroscope MBS-1 at a magnification of × 8–56. Microscopic characters were studied in squash preparations or hand-made sections in water, 10% KOH (K), Brilliant cresyl blue (BCr), or Lugol's iodine solution with and without pretreatment with KOH (K/I and I respectively) by use of a LOMO light microscope MBR-3 (to × 2000). Unless otherwise indicated, microscopic measurements are based on water mounts. Diaspore measurements were

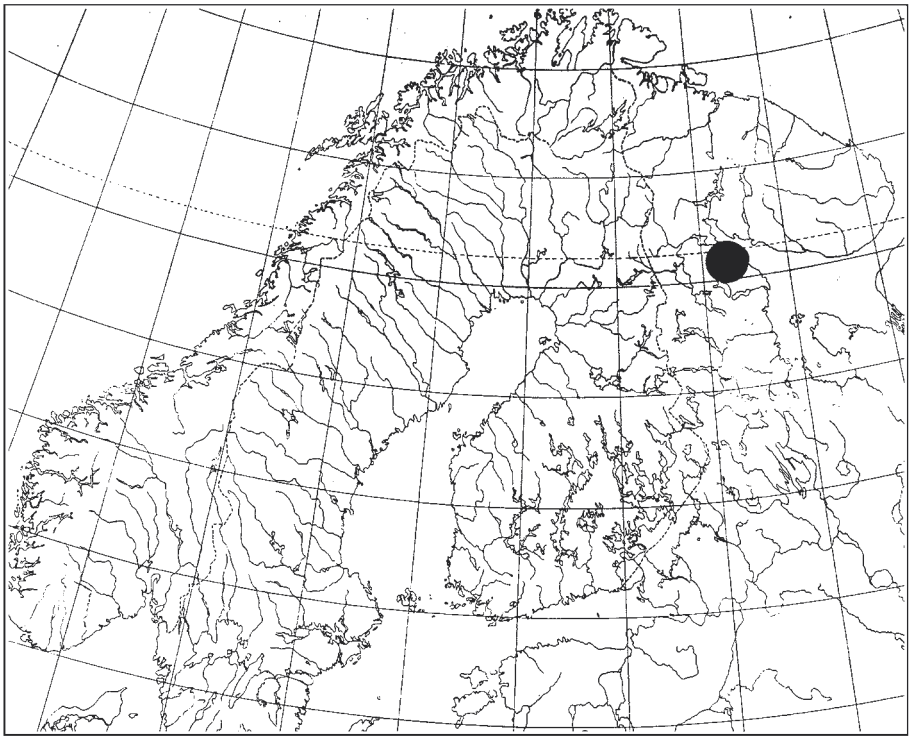

Fig. 1. Location of the study area (●).

made in water mounts and are given as the extreme values or: (min–) (X-SD) –X–(X+SD) (–max) rounded to the nearest 0.5 μm, where min and max are the extreme values, X the arithmetic mean, and SD the corresponding standard deviation. Measurements of all other anatomical characters were performed in water, K, or K/I, and their values represent the extreme range. The nomenclature of lichens and lichenicolous fungi follows Santesson (1993) or later works. Voucher specimens are housed in the herbarium of the Komarov Botanical Institute in St.-Petersburg (LE).

RESULTS AND DISCUSSION

Annotated list of taxa

The annotations include information on collecting sites, host lichens, herbarium numbers, and known distribution in Russia. Some incidental taxonomical notes are provided on the morphological characteristics when they deviate from those mentioned in the literature, or when the features of the taxa are unsufficiently known. Species denoted by an asterisk are new to Russia.

Abbreviations: D. H. – leg. D. Himelbrant; Is. – Island.

ABROTHALLUS PARMELIARUM (Sommerf.) Arnold – Srednii Is., 66°17'07" N, 33°42'03" E, elev. 3 m, rock outcrops, on *Parmelia omphalodes* (thallus), associated with *Phacopsis oxyspora*, 10 July 1999, D. H.; same locality, 66°17'06" N, 33°38'44" E, elev. 3 m, mixed spruce-pine forest, on *Melanelia septentrionalis* (thallus and thalline margin of apothecia), 10 July 1999, D. H.

Apothecia 0.2–0.5 mm diam., sometimes with whitish pruina. Hymenium K+ glaucous. Ascospores 12–17 × 4.5–6 μm (n=20). I+ blue staining of vegetative hyphae not observed. Usually *Abrothallus bertianus* De Not. is found on *Melanelia* spp., however that species differs from the present specimen in its epruinose smaller apothecia, shorter ascospores, and I+ blue hyphae (Hawksworth, 1983).

Known distribution in Russia: Karelia Republic: Karelia Keretina, Karelia Onegensis (Norrlin, 1876), Kuusamo (Fadeeva et al., 1997); Leningrad Region (Brenner, 1886; Vainio, 1878); Northern Ural (Zhurbenko, unpubl.); Putorana Plateau (Zhurbenko & Hafellner, 1999); Eastern Sayan, Tuva (Zhurbenko & Otnyukova, 2001); Altai (Zhurbenko & Davydov, 2000).

Bachmanniomyces uncialicola (Zopf) D.Hawksw. – Gorelyi Is., 66°17'43" N, 33°38'01" E, elev. 5 m, rock outcrops, on *Cladonia amaurocraea* (thallus), 4 July 1998, D. H., LE 210296.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Taimyr Peninsula (Zhurbenko, 1998; Zhurbenko & Pospelova, 2001); Tuva (Zhurbenko & Otnyukova, 2001).

Carbonea supersparsa (Nyl.) Hertel – Luda Ploskaya Is., 66°19'44" N, 33°52'0" E, elev. 3 m, rock outcrops, on *Lecanora* sp. (thallus, occasionally apothecia), 28 June 1999, D. H.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Franz Josef Land (Zhurbenko & Santesson, 1996); Putorana Plateau (Zhurbenko, 2000).

Cercidospora epipolytropa (Mudd) Arnold – Vicinities of Keret' village, 66°16'44" N, 33°34'02" E, elev. 5 m, on *Lecanora polytropa* (hymenium of apothecia), 3 July 2000, D. H., LE 210292.

Perithecia subglobose to broadly ellipsoidal, 0.075–0.1 mm diam., black, shiny, immersed to 1/3 exposed. Exciple entire, 5–10 μm thick, dark glaucous brown throughout. Interascal filaments sparingly branched, 1.5–2 μm diam., not or slightly swollen at the tips up to 3 μm. Asci subcylindrical to moderately clavate, with short stalk, 45–53 × 10–12 μm, 8-spored, tholus I-, K/I-, ascoplast I+ orange, K/I+ orange. Ascospores narrowly skittle-shaped, (0–)1-septate, 14–20 × 5–7 μm (n=20), hyaline, overlapping distichous.

Known distribution in Russia: Karelia Republic: Karelia Keretina, Karelia Ladogensis (Räsänen, 1939); Putorana Plateau (Zhurbenko & Hafellner, 1999); Taimyr Peninsula (Zhurbenko & Santesson, 1996).

*Chionosphaera cf. apobasidialis Cox – Gorelyi Is., 66°18'03" N, 33°37'48" E, elev. 8 m, sparse birch-pine forest, on *Melanelia olivacea* (thallus: mostly upper side, occasionally its lower side; apothecia), 18 Aug. 1999, D. H., LE 210293.

Basidiomata stipitate-capitate, cuneiform to mushroom-like, applanate from above, 0.075–0.225 mm diam., 0.075–0.125 mm tall, with short thick stipe 50–100 μm diam., buff, translucent, capitulum often white pruinose, superficial, dispersed to aggregated by a few (usually on young host apothecia), separated to occasionally confluent. Basidiospores aseptate, ellipsoidal, sometimes subglobose, obpyriform, lemon-shaped, slightly bent or irregular in shape, sometimes with noticeable scar, (5–)5.5–7–8(–9) × (2.5)–3–3.5(–4) μm (n=30), hyaline. The fungus produces no visible damage to its host. *Chionosphaera apobasidialis* was known to be saprotrophic on bark of various trees, and also lichenicolous on the thallus of *Lecidella* sp., *Parmelina quercina* and *Teloschistes flavicans* (Diederich, 1996).

Corticifraga fuckelii (Rehm) D.Hawksw. & R.Sant. – Luda Pesochnaya Is., 66°18' N, 33°46' E, elev. 1 m, on *Peltigera* cf. *canina* (thallus), 3 July 2000, D. H., LE 210288. – Srednii Is., 66°17'0" N, 33°39'55" E, elev. 3 m, rock outcrops, on *Peltigera* sp. (*P. canina* group) (thallus), associated with *Refractohilum peltigerae*, 27 July 2000, D. H. – Bol'shoi Gorelyi Is., 66°18'52" N, 33°36'36" E, elev. 4 m, on *Peltigera rufescens* (thallus), 23 July 2001, D. H.

Known distribution in Russia: Murmansk Region: Khibiny Mountains (Zhurbenko, 2001); Karelia Republic: Karelia Keretina, Karelia Ladogensis (Hawksworth & Santesson, 1990); Tuva (Zhurbenko & Otnyukova, 2001).

Echinothecium cladoniae Keissler – Keret' Is., 66°18'40" N, 33°41'53" E, elev. 64 m, forested rock outcrops, on *Cladonia coccifera* (podetia, pycnidia, primary squamules), 20 Aug. 1999, D. H.

Known distribution in Russia: Murmansk Region: Khibiny Mountains (Zhurbenko, 2001); Karelia Republic: Karelia Keretina; Northern Ural (Zhurbenko, unpubl.).

Endococcus propinquus (Körb.) D.Hawksw. Ð Srednii Is., 66°17'20" N, 33°39'19" E, elev. 53 m, rock outcrops, on *Porpidia tuberculosa* (thallus), 8 July 1999, D. H., LE 210285.

Known distribution in Russia: Karelia Republic: Karelia Keretina, Karelia Ladogensis (Norrlin, 1878; Räsänen, 1939; Triebel, 1989; Vainio, 1921); Leningrad Region (Brenner, 1886; Vainio,

1921); Franz Josef Land (Zhurbenko & Santesson, 1996); Taimyr Peninsula (Zhurbenko & Santesson, 1996); Putorana Plateau (Zhurbenko & Hafellner, 1999); Chukotka (Triebel, 1989).

Epicladonia sandstedei (Zopf) D.Hawksw. – Murmansk region, Karelia Keretina, Kandalaksha State Reserve, Velikii Is., square 27, spruce forest, on *Cladonia* sp. (primary squamules), growing on dying thallus of *Peltigera aphthosa*, 29 Aug. 1964, T. Piin, LE 210298.

The specimen fits well to description of *Epicladonia sandstedei* in Hawksworth (1981), except for the size of the pycnidia which are 100–200 µm diam., instead of 50–80(–125) µm.

Known distribution in Russia: Murmansk region: Karelia Keretina; Taimyr Peninsula (Zhurbenko, 1998); Northern Ural (Zhurbenko, unpubl.).

Epicladonia cf. stenospora (Harmand) D.Hawksw. – Srednii Is., mixed birch-aspen forest, 66°17'7" N, 33°38'10" E, elev. 3 m, on *Cladonia coniocraea* (podetia and underside of primary squamules), 10 July 1997, D. H., LE 210294.

Pycnidia 75–100 µm diam., black, shiny, erumpent, with the upper 1/2 to 5/6 exposed. Peridium brown. Conidia aseptate, subcylindrical, fusiform, allantoid or reniform, rounded at the apex and sometimes truncated at the base, straight or curved, (7–)7.5–8.5–9.5(–10) × (2–)2.5–3–3.5(–4) µm (n=20, in KOH), hyaline. *Epicladonia stenospora*, as described by Hawksworth (1981), differs from the specimen in having immersed pycnidia. The other species of *Epicladonia* with simple conidia – *E. simplex*, being similar to the specimen in its finally superficial pycnidia, differs from the latter in its larger pycnidia (100–175 µm) which develop on galls.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Taimyr Peninsula (Zhurbenko & Pospelova, 2001).

Geltingia associata (Th.Fr.) Alstrup & D.Hawksw. – Luda Vysokaya Is., 66°20' N, 33°52' E, elev. 9 m, on terricolous *Ochrolechia* sp. (thallus), 25 Aug. 1999, D. H., LE 210283. – Luda Sedlovataya Is., 66°18'37" N, 33°54'42" E, elev. 4 m, on *Ochrolechia androgyna* (thallus), 28 June 1999, D. H., LE 210283.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Franz Josef Land; Izvestii TsIK Archipelago; Taimyr Peninsula (Zhurbenko & Santesson, 1996).

Illosporium carneum Fr. – Srednii Is., open rock outcrops, 66°17'38" N, 33°39'03" E, elev. 9 m, on *Peltigera didactyla* (thallus), 25 July 1999, D. H. – Keret' Is., 66°18'05" N, 33°43'41" E, elev. 2 m, on *Peltigera didactyla* (thallus), associated with *Refractohilum peltigerae*, 21 Aug. 1999, D. H.

Known distribution in Russia: Karelia Republic: Karelia Keretina, Karelia Onegensis (Fadeeva et al., 1997); Novaya Zemlya (Lind, 1924); Northern Ural (Zhurbenko, unpubl.); Taimyr Peninsula (Zhurbenko & Santesson, 1996); Altai (Zhurbenko & Davydov, 2000).

*Karsteniomyces peltigerae (P.Karst.) D.Hawksw. – Luda Keretskaya II Is., rock outcrops, 66°19'32" N, 33°42'04" E, elev. 8 m, on *Peltigera rufescens* (thallus), 15 July 1999, D. H., LE 210273. – Srednii Is., 66°17'06" N, 33°38'44" E, elev. 3 m, mixed spruce-pine forest, on *Peltigera rufescens* (thallus), associated with *Scutula miliaris*, 10 July 1999, D. H., LE 210278.

*Lichenochora cf. polycoccoides Hafellner & R.Sant. – Luda Sedlovataya Is., 66°18'37" N, 33°54'42" E, elev. 4 m, rock outcrops, 28 June 1999, D. H., LE 210289. – Luda Keretskaya II Is., 66°19'32" N, 33°42'04" E, elev. 8 m, rock outcrops, 15 July 1999, D. H., LE 210284. – Luda Vysokaya Is., 66°20' N, 33°52' E, elev. 3 m, rock outcrops, 25 Aug. 1999, D. H. – Cheremshikha Is., 66°18' N, 33°54'E, elev. 10 m, rock outcrops, 14 July 1999, D. H. All specimens grew on *Physcia dubia* (thallus).

Perithecia broadly ellipsoidal, ca. 0.15 mm diam., immersed, often deeply so, and several together in dark brown to blackish bullate galls 0.5–2 mm diam. Exciple entire, paraplectenchymatous, brown. Interascal filaments not or sparingly branched, not swollen at the tips, uneven in diam. 2–6 µm wide, guttulate. Asci (broadly) cylindrical, short stalked, 62–90 × 8–17 µm, 8-spored, endoascus K/I-, I-, ascoplast K/I-, I+ red-orange. Ascospores broadly ellipsoidal, egg-shaped or pyriform, 0–1-septate [possibly the septum develops only on the later stages of spore maturation], septum sometimes irregularly inclined, cells often unequal, guttulate, (10–)11–13–14.5(–16) × (7–)7.5–8.5–9(–10) µm (n=25), finely verruculose, hyaline, usually uniseriate, sometimes partly biseriate.

Lichenochora polycoccoides was described as growing on "*Physcia tribacia*" and differs from the examined specimens in having finally brownish ascospores, which have been also reported to be always 1-septate (Hafellner, 1989). The specimens resemble also *Lichenochora weillii* (Werner) Hafellner & R. Sant., as described in Hafellner (1989), which differs, however, in its always 1-septate, smooth-walled, shorter ascospores (10–12 × 8–9.5 µm), and is found on another host genus *Physconia* in the same family Physciaceae.

Lichenoconium erodens M.S.Christ. & D.Hawksw. – Matrenin Is., 66°18'36" N, 33°38'06" E, elev. 2 m, on *Lecanora symmicta* and *L. pulicaris* (apothecia), 8 July 1998, D. H.

Known distribution in Russia: Karelia Republic: Karelia Keretina, Karelia Ladogensis (Fadeeva et al., 1997); Franz Josef Land (Zhurbenko & Santesson, 1996); Northern Ural (Zhurbenko, unpubl.); Altai (Zhurbenko & Davydov, 2000).

Lichenoconium lecanorae (Jaap) D.Hawksw. – Srednii Is., rock outcrops, 66°17'0" N, 33°39'55" E, elev. 3 m, on *Melanelia* sp. (hymenium of apothecia), growing on aspen, 27 July 2000, D. H. – Luda Vysokaya Dvinskaya Is., 66°15' N, 33°54' E, elev. 6 m, rock outcrops, on *Arctoparmelia centrifuga* (apothecia: hymenium and thalline margin), 26 June 2000, D. H. – Keret' Is., rock outcrops, 66°18'40" N, 33°41'53" E, elev. 64 m, on *Lecanora circumborealis* (hymenium of apothecia), growing on wood of a post, 20 Aug. 1999, D. H., LE 210291.

Pycnidia 50–100 µm diam. The infection is associated with blackened areas of the host lichen hymenium. *Lichenoconium erodens* which can also parasitize on the same host differs from this species in its characteristically smaller pycnidia (20–60 µm diam.) and much more serious damage to the host lichen, which becomes decolourized in the infected parts (Christiansen, 1980).

Known distribution in Russia: Karelia Republic: Karelia Keretina, Karelia Ladogensis (Fadeeva et al., 1997); Franz Josef Land (Zhurbenko & Santesson, 1996); Northern Ural (Zhurbenko, unpubl.); Taimyr Peninsula (Zhurbenko & Santesson,1996); Putorana Plateau (Zhurbenko & Hafellner, 1999).

*Lichenoconium xanthoriae M.S.Christ. – Gorelyi Is., 66°17'33" N, 33°37'38" E, elev. 8 m, on *Xanthoria candelaria* (apothecia: hymenium and thalline margin), growing on wood of a post, 6 June 1998, D. H., LE 210276.

Muellerella pygmaea (Körb.) D.Hawksw. s. lat. – Bol'shoi Gorelyi Is., 66°18'52" N, 33°36'36" E, elev. 6 m, rock outcrops, on *Rhizocarpon geographicum* (thallus), 23 July 1998, D. H.

Known distribution in Russia: Karelia Republic: Karelia Keretina, Karelia Ladogensis (Norrlin, 1878; Räsänen, 1939; Vainio, 1921), Kuusamo (Vainio, 1883, 1921); Leningrad Region (Vainio, 1921); Franz Josef Land (Zhurbenko & Santesson, 1996); Astrakhan Region ("Bogdo Mountain, on *Aspicilia aspera* Mer., 26 May 192... (?), V. P. Savicz", LE 207177); Severnaya Zemlya (Zhurbenko & Santesson, 1996); Taimyr Peninsula (Zhurbenko & Santesson, 1996); Putorana Plateau (Zhurbenko & Hafellner, 1999); New Siberian Is. (Zhurbenko & Santesson, 1996); Chukotka (Triebel, 1989).

Muellerella pygmaea (Körb.) D.Hawksw. var. pygmaea – Srednii Is., 66°17'6.5" N, 33°42'03" E, elev. 4 m, rock outcrops, on saxicolous *Lecidea* sp. (thallus), 10 July 1999, D. H.; same locality, on saxicolous *Lecidea lapicida* var. *pantherina* (thallus), 10 July 1999, D. H.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Putorana Plateau (Zhurbenko & Hafellner, 1999); Chukotka (Karatygin et al., 1999).

Muellerella pygmaea (Körb.) D.Hawksw. var. ventosicola (Mudd) Triebel – Keret' Is., 66°18'31" N, 33°41' E, elev. 43 m, rock outcrops, on *Rhizocarpon* sp. (thallus), 9 July 1998, D. H., LE 210268.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Northern Ural (Zhurbenko, unpubl.); Altai (Zhurbenko & Davydov, 2000).

*Odontotrema rhizocarpicola Zhurb., Diederich & Himelbrant (ined.) – Bolshoi Gorelyi Is., 66°18'N, 33°37'E, alt. 30 m, forested top of a rocky hill, on *Rhizocarpon geographicum* (thallus), 21 July 1998, D. H.

The species is described in a manuscript of P. Diederich, J. Etayo and M. Zhurbenko on the

lichenicolous species of *Odontotrema* which is submitted to "The Lichenologist".

Phacopsis cephalodioides (Nyl.) Triebel & Rambold – Srednii Is., 66°16'55" N, 33°42'03" E, elev. 3 m, mixed spruce forest, on *Hypogymnia physodes* (thallus), 3 July 1999, D. H., LE 210277.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Tuva (Zhurbenko & Otnyukova, 2001).

Phacopsis oxyspora (Tul.) Triebel & Rambold – Srednii Is., 66°17'07" N, 33°42'03" E, elev. 3 m, rock outcrops, on *Parmelia omphalodes* (thallus), associated with *Abrothallus parmeliarum*, 10 July 1999, D. H.

Known distribution in Russia: Karelia Republic: Karelia Keretina, Kuusamo (Fadeeva et al., 1997), Karelia Ladogensis (Räsänen, 1939); Leningrad Region (Brenner, 1886); Northern Ural (Zhurbenko, unpubl.); Eastern Sayan, Tuva (Zhurbenko & Otnyukova, 2001); Putorana Plateau (Zhurbenko & Hafellner, 1999); Altai (Zhurbenko & Davydov, 2000).

Phaeosporobolus alpinus R.Sant., Alstrup & D.Hawksw. – Luda Ileika II Is., 66°21' N, 33°45' E, elev. 8 m, on terricolous *Ochrolechia* sp. (thallus), associated with *Sphaerellothecium araneosum*, 9 July 2000, D. H.

Known distribution in Russia: Murmansk Region (Zhurbenko, 2001); Karelia Republic: Karelia Keretina; Franz Josef Land (Zhurbenko & Santesson, 1996); Northern Ural (Zhurbenko, unpubl.); Severnaya Zemlya (Zhurbenko & Santesson, 1996); Taimyr Peninsula (Zhurbenko, 1998; Zhurbenko & Pospelova, 2001; Zhurbenko & Santesson, 1996); Putorana Plateau (Zhurbenko & Hafellner, 1999).

*Phoma cytospora (Vouaux) D.Hawksw. – Srednii Is., 66°17'06" N, 33°38'44" E, elev. 3 m, mixed spruce-pine forest, on neighbouring thalli of *Hypogymnia physodes* and *Parmelia sulcata*, 10 July 2000, D. H., LE 210300.

Pycnidia 40–70 µm diam., black, 1/4 to1/8 erumpent, associated with necrotic decolourized patches on the host thallus. Conidia fusiform to bacilliform, straight or slightly curved, rounded at the apex and slightly attenuated and truncated at base, 5–8 × 1.5–2 µm (n=20), smooth, hyaline. Conidiogenous cells obpyriform. The fungus has been reported growing on the lichen genera *Flavoparmelia*, *Hypotrachyna*, *Melanelia*, *Parmelia*, *Parmotrema*, *Ramalina*, and *Rimelia* (Hawksworth, 1981; Santesson, 1993), here it is for the first time reported from Hypogymnia.

*Plectocarpon cladoniae R.Sant. – Srednii Is., 66°17'07" N, 33°42'03" E, elev. 3 m, rock outcrops, on *Cladonia pocillum* (primary squamules), 10 July 1999, D. H., LE 210299.

Ascomata apothecioid, superficial, applanate-elevated, more or less rounded, emarginate, 0.5–2 mm diam., dark brown to almost black, shiny, disc surface roughly verruculose, arising singly, but occasionally confluent. Epithecium dark reddish-brown. Hymenium 70–100 µm tall, colourless to pale brownish, divided by brownish strands into loculi 70–120 µm wide, I+ red. Hypothecium 200–250 µm tall, of textura epidermoidea, dark reddish-brown. Interascal filaments branched, flexuose, 2–3 µm diam., apically swollen to 4–5 µm. Asci clavate to broadly clavate, 58–70 × 15–20 µm (n=10), 4-spored, tholus K/I+ blue, protoplast K/I+ orange-red. Ascospores oval to fusiform, (2–)5-septate, 22–29 × 6–8 µm (n=12), with halo 1 µm thick, smooth-walled, colourless to finally brownish. The apothecia of the fungus are located directly on the upper surface of the host squamules or sometimes on their bullate to stipitate swellings. This rarely reported species was described from Sweden, growing on phyllocladia of *Cladonia pyxidata* (Santesson, 1994).

Pronectria erythrinella (Nyl.) Lowen – Srednii Is., 66°17'29" N, 33°38'43" E, elev. 5 m, on *Peltigera canina* (mostly upper side of thallus, occasionally also its lower side and apothecia), 29 June 2000, D. H., LE 210275.

Known distribution in Russia: Karelia Republic: Karelia Keretina; "Bologoye: prov. Nangorva, 29 Aug., 10 Sept. 1897, W. Trazschel (S)" (Rossman et al., 1999); Northern Ural (Zhurbenko, unpubl.).

Refractohilum peltigerae (Keissl.) D.Hawksw. – Srednii Is., 66°17'0" N, 33°39'55" E, elev. 3 m, rock outcrops, on *Peltigera* sp. (*P. canina* group) (thallus), associated with *Corticifraga fuckelii*, 27 July 2000, D. H., LE 210274. – Keret' Is., 66°18'5" N, 33°43'41" E, elev. 2 m, on *Peltigera didactyla* (thallus), associated with *Illosporium carneum*, 21 Aug. 1999, D. H., LE 210269.

Conidia hyaline, simple, (15–)18–21–24(–28) × (6–)6.5–7.5–8.5(–10) µm (n=30).

Known distribution in Russia: Karelia Republic: Karelia Keretina; Tuva (Zhurbenko & Otnyukova, 2001).

Scutula krempelhuberi Körb. Đ Coast of Chupa Bay near Cherlivoe Lake, 66°17'28" N, 33°33'17" E, elev. 10 m, on *Solorina saccata* (thallus), 26 July 2001, D. H.

Known distribution in Russia: Murmansk Region (Vainio, 1883; Zhurbenko, 2001); Karelia Republic: Karelia Keretina.

Scutula miliaris (Wallr.) Trevis. – Srednii Is., 66°17'06" N, 33°38'44" E, elev. 3 m, mixed spruce-pine forest, on *Peltigera rufescens* (thallus), associated with *Karsteniomyces peltigerae*, 10 July 1999, D. H., LE 210272. – Gorelyi Is., 66°17'43" N, 33°37'38" E, elev. 8 m, coastal rocky terrace, on *Peltigera* sp. (thallus), 7 July 1998, D. H., LE 210280.

Known distribution in Russia: Murmansk Region (Vainio, 1934; Zhurbenko, 2001); Karelia Republic: Karelia Keretina, Karelia Ladogensis (Fadeeva et al., 1997; Räsänen, 1939; Vainio, 1934, 1940); Leningrad region (Vainio, 1934); Chukotka (Karatygin et al., 1999).

Sphaerellothecium araneosum (Rehm ex Arnold) Zopf – Luda Ileika II Is., 66°21' N, 33°45' E, elev. 8 m, on terricolous *Ochrolechia* sp. (thallus), associated with *Phaeosporobolus alpinus*, 9 July 2000, D. H.

Known distribution in Russia: Murmansk Region (Zhurbenko, 2001); Karelia Republic: Karelia Keretina; Franz Josef Land (Zhurbenko & Santesson, 1996); Putorana Plateau (Zhurbenko & Hafellner, 1999); Taimyr Peninsula (Zhurbenko, 1998; Zhurbenko & Pospelova, 2001; Zhurbenko & Santesson, 1996); New Siberian Is. (Zhurbenko & Santesson, 1996); Chukotka (Karatygin et al., 1999).

*Sphaerellothecium conioides (Nyl.) Roux & Diederich – Srednii Is., 66°17'20" N, 33°39'0" E, elev. 13 m, on *Baeomyces rufus* (thallus), 9 July 1999, D. H., LE 210287.

Perithecia globose, 50–70 µm diam., black, usually 5/6 to 3/4 immersed, separated, dispersed, numerous, associated with brown vegetative hyphae which are BCr+ blue. Peridium dark. Hamathecial filaments not observed. Asci broadly clavate, 28–45 × 10–16 µm (n=15), 8-spored. Ascospores soleiform, 1-septate, constricted at the septum, (11–)11.5–13–14(–16) × 3.5–4–4.5(–5) µm (n=40), long remaining hyaline but finally brown, sometimes with large guttules, biseriate or irregularly arranged in the ascus, tholus K/I-, BCr-, protoplast K/I+ orange, BCr+ blue. Though ascospores of the species have been reported to be halonate (Ihlen, 1998), halo was not observed. The host thallus turns grey in the infection spots.

Spaerellothecium contextum Triebel – Srednii Is., 66°17'06" N, 33°39'45" E, elev. 2 m, rock outcrops, on *Protoparmelia badia* (apothecia: hymenium and thalline margin; thallus), 13 July 1999, D. H., LE 210281.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Chukotka (Karatygin et al., 1999).

Sphaerellothecium minutum Hafellner – Srednii Is., 66°17'05" N, 33°42'17" E, elev. 3 m, coastal cliffs, 2 July 1999, D. H.; same locality, 2 July 1997, D. H.; same locality, rock outcrops, June 1993, M. Zelenskaya, LE 210290. – Cheremshikha Is., 66°18' N, 33°54' E, elev. 25 m, rock outcrops, 28 June 1999, D. H.; same locality, elev. 9 m, rock outcrops, 14 July 1999, D. H. All specimens grew on *Sphaerophorus fragilis* (thallus).

Known distribution in Russia: Karelia Republic: Karelia Keretina; Franz Josef Land (Zhurbenko & Santesson, 1996); Northern Ural (Zhurbenko, unpubl.); Taimyr Peninsula (Zhurbenko, 1998; Zhurbenko & Santesson, 1996); Putorana Plateau (Zhurbenko & Hafellner, 1999); Altai (Zhurbenko & Davydov, 2000).

*Stigmidium cf. mitchellii Roux & Bricaud – Medyanka Is., 66°18' N, 33°51' E, elev. 5 m, open tundra-like vegetation (luda), on *Pannaria pezizoides* (thallus and hymenium of apothecia), 11 July 2000, D. H.

Stigmidium peltideae (Vain.) R.Sant. – Srednii Is., 66°17'0" N, 33°39'55" E, elev. 3 m, rock outcrops, on *Peltigera venosa* (thallus), 29 June 1999, D. H., LE 210270.

Known distribution in Russia: Karelia Republic: Karelia Keretina; Franz Josef Land (Zhurbenko & Santesson, 1996); Northern Ural (Zhurbenko, unpubl.); Taimyr Peninsula

(Zhurbenko, 1998; Zhurbenko & Santesson, 1996); Altai (Zhurbenko & Davydov, 2000); Chukotka (Karatygin et al., 1999).

*Stigmidium pumilum (Lettau) Matzer & Hafellner – Gorelyi Is., 66°17'43" N, 33°38'01" E, elev. 5 m, rock outcrops, 4 July 1998, D. H., LE 210282. – Srednii Is., 66°17'0" N, 33°39'55" E, elev. 3 m, rock outcrops, 29 June 1999, D. H. Both specimens grew on *Physcia caesia* (thallus).

Known distribution in Russia: Karelia Republic: Karelia Keretina; Northern Ural (Zhurbenko, unpubl.).

Stigmidium solorinarium (Vain.) D.Hawksw. – Coast of Chupa Bay near Cherlivoe Lake, 66°17'28" N, 33°33'17" E, elev. 10 m, on *Solorina saccata* (thallus), 26 July 2001, D. H.

Known distribution in Russia: Murmansk Region (Zhurbenko, 2001); Karelia Republic: Karelia Keretina; Northern Ural (Zhurbenko, unpubl.); Taimyr Peninsula (Zhurbenko & Santesson, 1996); Chukotka (Karatygin et al., 1999).

Taeniolella beschiana Diederich – Medyanka Is., 66°18' N, 33°51' E, elev. 5 m, open tundra-like vegetation (luda), on *Cladonia coccifera* (basal and podetial squamules), 11 July 2000, D. H.

Known distribution in Russia: Murmansk Region (Zhurbenko, 2001); Karelia Republic: Karelia Keretina; Franz Josef Land (Zhurbenko & Santesson, 1996); Taimyr Peninsula (Zhurbenko, 1998), Tuva (Zhurbenko & Otnyukova, 2001).

*Xenonectriella ornamentata (D.Hawksw.) Rossmann – Sosnovets Is., 66°13' N, 33°55' E, elev. 12 m, rock outcrops, on *Peltigera didactyla* (decaying thallus), 22 Aug. 1999, D. H., LE 210279.

Asci cylindrical, 4-spored. Ascospores fusiform to oval, (0–)1-septate, with equal cells, constricted at the septum, 20–24.5–29(–37) × (7–)7.5–8.5–9.5(–10) µm (n=20), wall verruculose.

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REFERENCES

Anonymous. 1980. *Vegetation of the europian part of the USSR* (in Russian). Nauka, Leningrad. 429 pp.

Anonymous. 1989. *Atlas of the Karelian ASSR* (in Russian). GUGK, Moscow. 40 pp.

Brenner M. 1886. Bidrag till kännedom af Finska vikens övegetation. IV. Hoglands lafvar. *Medd. Soc. Fauna et Flora Fennica* 3: 1–144.

Cajander, A. K. 1906. *Suomen kasvio.* Helsinki. 763 pp.

Christiansen, M. S. 1980. Lichenoconium erodens and some other fungi parasitic on Lecanora conizaeoides. *Lichenologist* 12: 149–154.

Diederich, P. 1996. The Lichenicolous Heterobasidiomycetes. *Biblioth. Lichenol.* 61: 1–198.

Fadeeva, M. A., Golubkova, N. S., Vitikainen, O. & Ahti, T. 1997. *Preliminary list of lichens and lichenicolous fungi of Karelia* (in Russian). Karel'skii nauchnyi tsentr RAN, Petrozavodsk. 100 pp.

Hafellner, J. 1989. Studien über lichenicole Pilze und Flechten VII. Über die neue Gattung Lichenochora (Ascomycetes, Phyllachorales). *Nova Hedwigia* 48(3–4): 357–370.

Hawksworth, D. L. 1981. The lichenocolous Coleomycetes. *Bul. Br. Mus. Nat. Hist. (Bot.)* 9: 1–98.

Hawksworth, D. L. 1983. A key to the lichen-forming, parasitic, parasymbiotic and saprophytic fungi occurring on lichens in the British Isles. *Lichenologist* 15: 1–44.

Hawksworth, D. L. & Santesson, R. 1990. A revision of the lichenicolous fungi previously referred to Phragmonaevia. *Biblioth. Lichenol.* 38: 121–143.

Ihlen, P. G. 1998. The lichenicolous fungi on species of the genera Baeomyces, Dibaeis, and Icmadophila in Norway. *Lichenologist* 30(1): 27–57.

Karatygin, I. V., Nezdoiminogo, E. L., Novozhilov, Y. K. & Zhurbenko, M. P. 1999. *Russian Arctic Fungi. Check-list* (in Russian). St.-Petersburg. 212 pp.

Lind, J. 1924. Ascomycetes and Fungi imperfecti. *Rep. Sci. Res. Norveg. Exped. Novaya Zemlya 1921* (Kristiania) 19: 1–28.

Norrlin J. P. 1876. Flora Kareliae Onegensis. II. Lichenes. *Medd. Soc. Fauna et Flora Fennica* 1: 1–46.

Norrlin, J. P. 1878. Symbolae ad floram Ladogensi-Karelicam. *Medd. Soc. Fauna et Flora Fennica* 2: 1–34.

Rossman, A. Y., Samuels, G. J., Rogerson, C. T. & Lowen, R. 1999. Genera of Bionectriaceae, Hypocreaceae and Nectriaceae (Hypocreales, Ascomycetes). *Studies in Mycology* 42: 1–248.

Räsänen, V. 1939. Die Flechtenflora der nördlichen Küstengegend am Laatokka-See. *Ann. Bot. Soc. Zool.-Bot. Fenn. Vanamo.* 12(1): 1–240.

Santesson, R. 1993. *The lichens and lichenicolous fungi of Sweden and Norway*. SBT-förlaget, Lund. 240 pp.

Santesson, R. 1994. Fungi lichenicoli exsiccati. Fasc. 7 & 8 (Nos. 151–200). *Thunbergia* 21: 1–18.

Triebel, D. 1989. Lecideicole Ascomyceten. *Biblioth. Lichenol.* 35: 1–278.

Tsinzerling, Yu. D. 1934. Geography of plant cover of the north-west of the europian part of the USSR. (in Russian). *Trudy Geomorphologicheskogo Instituta* (Leningrad). Phisiko-geographicheskaya Series 4: 1–377.

Vainio E. 1878. Lichenes in viciniis Viburgi observati. *Medd. Soc. Fauna et Flora Fennica* 2: 35–72.

Vainio, E. A. 1883. Adjumenta ad Lichenographiam Lapponiae fennicae atque Fenniae borealis. II. *Medd. Soc. Fauna et Flora Fennica.* 10: 1–230.

Vainio E. A. 1921. Lichenographia Fennica. I. Pyrenolichenes. *Acta Soc. pro Fauna et Flora Fennica* 49(2): 1–274.

Vainio E. A. 1934. Lichenographia Fennica. IV. Lecideales II. *Acta Soc. pro Fauna et Flora Fennica* 57(2): 1–506.

Vainio E. A. 1940. Lichenes in insula Kotiluoto lakus Laatokka collecti. *Ann. Univ. Turkuensis. Ser. A. 7*, 1: 1–25.

Zhurbenko, M. P. 1998. Lichens and lichenicolous fungi from the north of Pyasino Lake, Taimyr Peninsula, Siberia. *Folia Cryptog. Estonica* 32: 153–159.

Zhurbenko, M. P. 2000. Lichens and lichenicolous fungi of the Putorana Reserve. (in Russian). *Flora i fauna zapovednikov.* Moscow 89: 1–55.

Zhurbenko, M. P. 2001. Lichenicolous fungi from Murmansk region of Russia. *Mikologiya i Fitopatologiya* 35: 34–40.

Zhurbenko, M. P. & Davydov, E. A. 2000. Lichenicolous fungi and some lichens from the Russian Altai, southern Siberia. *Folia Cryptog. Estonica* 37: 109–118.

Zhurbenko, M. P. & Hafellner, J. 1999. Lichenicolous fungi from the Putorana plateau, Siberian Subarctic. *Folia Cryptog. Estonica* 34: 71–79.

Zhurbenko, M. P. & Otnyukova, T. N. 2001. Lichenicolous fungi from the Sayan-Tuva Mountains, Southern Siberia, Russia. *Folia Cryptog. Estonica* 38: 79–84.

Zhurbenko, M. P. & Pospelova, E. B. 2001. Lichenes ac fungi lichenophili in vicinitate lacus Syrutaturku (reservatum Taimyricum, Taimyr Centralis). (in Russian). *Novitates Systematicae Plantarum non Vascularium* 34: 134–139.

Zhurbenko, M. P. & Santesson, R. 1996. Lichenicolous fungi from the Russian Arctic. *Herzogia* 12: 147–161.

Folia Cryptog. Estonica, Fasc. 39: 61–63 (2002)

NEW ESTONIAN RECORDS

Helotiales (Ascomycetes)

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15 species of Helotiales new for Estonia, collected in recent years, have been added to the Mycological Herbarium of Institute of Zoology and Botany (TAA). The species have been identified by the author if not otherwise indicated.

Claussenomyces prasinulus (P. Karst.) Korf & Abawi – Harjumaa, Viimsi Comm., Naissaar, Sinkarka, 59°34.2'N 24°32.2'E, on fallen cones of *Picea abies*, 6 Oct 2001 K. Leenurm (TAA 165957).

Hyalopeziza corticicola (Dennis) Raitv. – Saaremaa, Viidu, a bog left of the road about 300 m W of Viidu bus stop, 58°17.2'N 22°06.5'E, on small dead sticks of *Myrica gale*, 28 July 2001 A. Raitviir (TAA 137935).

Hymenoscyphus equisetinus (Velen.) Dennis – Harjumaa, Viimsi Comm., Naissaar, Sinkarka, 59°34.2'N 24°32.2'E, on dead stems of *Equisetum palustre*, 1 June 2002 V. Kastanje (TAA 185510).

Hymenoscyphus translucens (White) Arendh. – Harjumaa, Viimsi Comm., Naissaar, Sinkarka, 59°34.2'N 24°32.2'E, on fallen leaves of *Betula* sp., 6 Oct 2001 K. Leenurm (TAA 165951).

Lachnum apalum (Berk. & Broome) Nannf. – Harjumaa, Viimsi Comm., Naissaar, Sinkarka, 59°34.2'N 24°32.2'E, on dead leaves of *Scirpus sylvaticus*, 1 June 2002 V. Kastanje (TAA 185509).

Lachnum charretii Raitv. & G. Garcia – Harjumaa, Viimsi Comm., Naissaar, Mustametsa, 59°35.7'N 24°30.5'E, on fallen decaying leaves of *Betula* sp. and *Salix* sp. 22 May 2002 B. Kullman (TAA 179851 & 179854).

Lachnum fasciculare Velen. – Saaremaa, Viidu, a bog left of the road about 300 m W of Viidu bus stop, 58°17.2'N 22°06.5'E, on small dead sticks of *Myrica gale*, 28 July 2001 A. Raitviir (TAA 137933).

Lachnum cf. subauratum (Ellis) Raitv. – Harjumaa, Viimsi Comm., Naissaar, Sinkarka, 59°34.2'N 24°32.2'E, on fallen leaves of *Betula* sp. 1 June 2002 B. Kullman (TAA 179860).

Micropeziza cornea (Berk. & Broome) Nannf. – Harjumaa, Viimsi Comm., Naissaar, Kunilasoo, 59°35'N 24°31'E, on dead leaves of *Eriophorum* sp., 5 Oct 2001 K. Leenurm (TAA 165892). Tartumaa, Nõo Comm., Keeri, 58°20'N 26°31' E, on dead leaves of *Carex* sp., 1 Nov 2002 A. Raitviir (TAA 182260).

Mollisia clavata Gremmen – Harjumaa, Viimsi Comm., Naissaar, Mustametsa ots, 59°35.7'N 24°30.5'E, on dead stems of *Filipendula ulmaria*, 31 May 2002 B. Kullman (TAA 179855).

Mollisia perparvula P. Karst. – Harjumaa, Viimsi Comm., Naissaar, Mustametsa, 59°35.7'N 24°30.5'E, on decaying wood of *Betula* sp., 31 May 2002 B. Kullman (TAA 179858).

Ombrophila lilacina (Wulfen: Fr.) P. Karst – Tartumaa, Võnnu Comm., in vincinity of Järvselja Forestry Centre, 58°16.1'N 27°18.1'E, on dead wood of a deciduous tree, 27 Aug 1999 K. Leenurm (TAA 165483).

Phaeohelotium nobile (Velen.) Dennis – Harjumaa, Viimsi Comm., Naissaar, Sinkarka, 59°34.2'N 24°32.2'E, on decaying deciduous wood, 6 Oct 2001 K. Leenurm (TAA 165887).

Phaeohelotium trabinellum (P. Karst.) Dennis – Harjumaa, Viimsi Comm., Naissaar, Suursadam, 59°33.8'N 24°32.5' E, on dead wood of *Betula* sp. 4 Oct 2001 K. Leenurm (TAA 165888).

Tapesia prunorum (Fr.) Fuckel – Harjumaa, Viimsi Comm., Naissaar, Sinkarka, 59°34.2'N 24°32.2'E, on decaying wood of *Betula* sp., 1 June 2002 I. Saar (TAA 182086) & B. Kullman (TAA 179861).

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Pezizales (Ascomycetes)

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Cheilymenia aurantiaco-rubra K.S. Thind & S.C. Kaushal – Tartumaa Co., Nõo Comm., Tõravere, on the bank of Nõo brook (58°15.5'N 26°29'E), on damp soil where animals have urinated, 6 June 2002 B. Kullman (TAA 179863).

Apothecia up to 2 mm in diameter, clustered together in patches, sessile, sub-globose at first later cupulate, orange (peach to apricot), hairy. Hairs superficial, up to 250 × 16 µm, usually 13 septate, pale brown. Asci cylindrical, 180–250 × 16–21 µm, 8-spored, ascospores oval-ellipsoid (length/width ratio 1.2–1.3), 14.8–16.4 × 11.5–12.3 µm, smooth, eguttulate.

Very rare. The second finding in the world. Known before from Chandigarh, India.

Kotlabaea deformis (P. Karst.) Svrcek – Tartumaa Co., Ülenurme Comm., Tõrvandi (56°19.5'N 26°41'E), on damp soil alongside a forest road, 22 May 2002 B. Kullman (TAA 179844).

Ascospores 14.8–17.2 × 8.2–9.8 µm.

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REFERENCES

Larsen, L. & Knudsen, H. (Eds.) 2000. *Nordic Macromycetes*. Vol. 1. Ascomycetes. Nordsvamp, Copenhagen. 309 pp.

Thind, K.S. & Kausal, S.C. 1980. Two new species of Chelymenia (Pezizales) from India. *Indian Phytopathol.* 33 (3): 427–432.

Lichens

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Nine species of lichenized fungi new for Estonia have been identified; their distribution and frequency data are reported here. Abbreviations of distribution regions and of frequency classes in Estonia follow Randlane & Saag (1999).

Arthonia cinnabarina (DC.) Wallr. – WIs: Saaremaa, Viidumäe Nature Reserve (58°19'N 22°05'E), on dry twigs of *Sorbus aucuparia*, 28 July 1963, det. T. Randlane & E. Nilson (TU 17 771). Freq.: rr.

Eopyrenula leucoplaca (Wallr.) R. C. Harris – NW: Harjumaa, Lahemaa National Park, Nõmmeveski (59°30'N 25°47'E), on *Acer platanoides* in broad-leaved klint forest, 28 Aug 2002 I. Jüriado, det. I. Jüriado (TU); NE: Lääne-Virumaa, near Kunda (Lontova) (59°31'N 26°34'E), on *Fraxinus excelsior* and *Ulmus glabra* in broad-leaved klint forest, 11 Sept 2002 I. Jüriado, det. I. Jüriado (TU). Freq.: rr.

Caloplaca crenulatella (Nyl.) H. Olivier – NE: Jõgevamaa, Voore Ecological Station (58°42'N 26°44'E), on mortar, 5 July 1991, det. T. Randlane (TU 20 313); WIs: Saaremaa, Kuusnõmme Peninsula, Vesikoja (58°21'N 21°56'E), on calcareous pebbles, 18 June 1983 T. Randlane, det T. Randlane (TU 17 661). Freq.: rr.

Catillaria aphana (Nyl.) Coppins – WIs: Saaremaa, Vilsandi Island, near the centre of Vilsandi Nature Reserve (58°23'N 21°52'E), on calcareous stones of a wind-mill, 30 May 1981 T. Randlane, det. T. Randlane (TU 9358). Freq.: rr. Earlier identified as *Catillaria cryptophila* Th. Fr. & Almq. (Randlane & Saag, 1999); the latter taxon is now excluded from the list of Estonian lichens (Randlane et al., 2002).

Lecanora flotowiana Spreng. (selected specimens) – NW: Raplamaa, near Eidapere (58°42'N 24°56'E), on erratic boulder in meadow, 30 July 1996 I. Jüriado, det. I. Jüriado (TU

8964); NE: Lääne-Virumaa, near Viru-Nigula (59°26'N 26°42'E), on calcareous rocks of old ruins, 21 June 1961 S. Pärn, det. I. Jüriado (TU 2197); SE: Põlvamaa, Kanepi (57°59'N 26°46'E), on mortar of church yard, 23 July 1996 I. Jüriado, det. I. Jüriado (TU); SW: Pärnumaa, Eametsa village near Sauga (58°26'N 24°29'E), on concrete electricity post in farm, 26 May 1996 I. Pilt, det. I. Jüriado (TU); WIs: Hiiumaa, Harilaid Island (West-Estonian Archipelago) (58°58'N 23°05'E), on mortar of old ruins, 9 July 2002 I. Jüriado and A. Suija, det. I. Jüriado (TU). Freq.: st fq.

Lecanora salina H. Magn. (selected specimens) – NW: Läänemaa, Virtsu-Laelatu-Puhtu Landscape Reserve, Puhtu peninsula (58°34'N 23°33'E), on granite boulder near seashore, 10 Oct 1986 J. Pütsepp, det. I. Jüriado (TU); NE: Harjumaa, Kaberneeme village (59°31'N 25°16'E), on granite in seashore, 4 Aug 1995 I. Jüriado and T. Randlane, det. I. Jüriado (TU); WIs: Saaremaa, Vilsandi National Park, Panga nukk (58°24'N 21°54'E), on calcareous cliff, 21 June 1980 T. Randlane, det. I. Jüriado (TU 2347). Freq.: st r.

Lecanora xanthostoma Cl. Roux ex Fröberg (selected specimens) – NW: Harjumaa, Kose (59°11'N 25°10'E), on concrete electricity post by roadside, 29 July 1996 I. Jüriado, det. I. Jüriado (TU); NE: Järvamaa, Ambla (59°12'N 25°51'E), on concrete electricity post in church yard, 29 July 1996 I. Jüriado, det. I. Jüriado (TU); SE: Võrumaa, Vastse-Roosa (57°35'N 26°40'E), on calcareous rock by roadside, 25 July 1996 I. Jüriado, det. I. Jüriado (TU); SW: Pärnumaa, Vändra (58°39'N 25°04'E), on concrete electricity post by roadside, 30 July 1996 I. Jüriado, det. I. Jüriado (TU); WIs: Saaremaa, Muhu Island, Koguva village (58°36'N 23°05'E), on calcareous rock in stone wall, 13 June 1984 T. Randlane, det. I. Jüriado (TU 2165). Freq.: st fq.

Lepraria atlantica Orange – SE: Tartumaa, Laeva forestry, forest square 218 (58°29'N 26°12'E), on bark of *Pinus sylvestris*, 6 July 1999 P. Lõhmus, det. L. Saag (TU). Freq.: rr. The specimen contains atranorin, cf. roccellic acid, cf. rangiformic acid and porphyrilic acid (TLC 60–12).

Pertusaria ophthalmiza (Nyl.) Nyl. – NE: Ida-Virumaa, Kohtla-Järve, Rääsa (58°16'N 27°05'E), mixed forest, on Betula, 28 June 1961 S. Pärn, det. T. Randlane (TU); SE, Tartumaa, Kärkna Forestry, Murru (58°28'N 26°39'E), swamp forest, on *Alnus glutinosa*, 24 June 1968 A.–L. Sõmermaa, det. T. Randlane (TU). Freq.: rr.

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REFERENCES

Randlane, T. & Saag, A. (eds). 1999. Second checklist of lichenized, lichenicolous and allied fungi of Estonia. *Folia Cryptog. Estonica* 35: 1-132.

Randlane, T., Saag, A. & Suija, A. 2002. Lichenized, lichenicolous and allied fungi of Estonia. http://www.ut.ee/lichens/fce.html.

Sylvia Sharnoff Education Award

On the occasion of the 5th International Congress of Lichenology, which will be held in Tartu (Estonia) in August 2004, the International Association for Lichenology (IAL) will introduce and present the Sylvia Sharnoff Education Award. The Award is dedicated to the memory of Sylvia Duran Sharnoff, a remarkable lichen photographer, who conceived of the idea of a colour-illustrated, popularized but scientifically accurate treatment of the lichens of North America and, with her husband, Stephen Sharnoff, produced almost 1000 superb lichen photographs for the book.

The award will be given to the best web page devoted to lichens, prepared by a class or a school at pre-university level, in the years 2000 to 2003 (in any language). Any aspect of lichen biology used in an educational program would be acceptable. The selection of the Award winner[s] will be entrusted to an International Committee of three members, including a non-lichenological expert in the field of education, and will involve a pre-screening of the web pages by various national/regional lichenological societies worldwide. The main evaluation criteria will be: aesthetic appeal, clarity, educational impact; lichenological accuracy, useful links, and practicality for the targeted age group.

A metadata web page with links to all of the submitted web pages, and a publication devoted to the Award will be forwarded to all participants. A printed selection of the best web pages will constitute the core of an exhibition on "Lichens and Education", which will be inaugurated in Tartu in August 2004, and which will then circulate to several other cities and towns elsewhere in the world.

To apply, an interested class or school can use a simple form available on-line, with additional information (after January 15, 2003), at: **http://dbiodbs.univ.trieste.it/lichens/Sharnoff_Award**

Deadline for submissions is December 31, 2003.

Pier Luigi Nimis
President of the IAL

Sylvia Sharnoffi autasu

Rahvusvaheline Lihhenoloogia Assotsiatsioon (IAL) esitleb ning jagab 2004. a. augustis Tartus toimuval 5-ndal Rahvusvahelisel Lihhenoloogia Kongressil esmakordselt välja Sylvia Sharnoffi nimelise haridusalase autasu. Nimetatud autasu on pühendatud Sylvia Duran Sharnoffi mälestusele, kes oli silmapaistev samblike fotograaf ja Põhja-Ameerika samblike teadusliku, värvifotodega illustreeritud määraja idee algataja. Koos oma abikaasa Stephen Sharnoffiga oli ta selle 2001. a-l ilmunud raamatu illustreerija ja enam kui 1000 suurepärase samblikufoto autor.

Autasu antakse parimale samblikke käsitlevale veebilehele, mis on koostatud aastatel 2000–2003 kõrgharidus-eelsete koolide (ka klasside või huviringide) poolt ükskõik millises keeles. Veebilehel võib tutvustada samblike bioloogia igat tahku; materjal ja esitusviis peavad sobima õppetöös tarvitamiseks. Autasu võitja(d) määrab rahvusvaheline komitee, mis koosneb kolmest liikmest; sh on esindatud ka mittelihhenoloogist haridusekspert. Veebilehtede eelhindamine usaldatakse komitee poolt rahvuslikele või regionaalsetele lihhenoloogia seltsidele jms ühendustele. Hindamise põhikriteeriumid on:

- esteetiline välimus, arusaadavus, hariduslik mõju;
- lihhenoloogiline täpsus, kasulikud viited, sihtgrupi ea arvestamine.

Kõigile konkursist osavõtjatele edastatakse kokkuvõttev veebileht (viidetega kõigile esitatud veebilehtedele) ning Sylvia Sharnoffi autasu käsitlev publikatsioon. Parimate veebilehtede valikulised väljatrükid moodustavad põhiosa näitusest "Samblikud ja haridus", mida esmakordselt tutvustatakse Tartus augustis 2004, ning mis hiljem saadetakse mitmetesse teistesse linnadesse kogu maailmas.

Konkursist osavõtuks tuleb asjast huvitatud klassil või koolil täita arvutivõrgu vorm, mis on peale 15. jaanuari 2003. a. kätte saadav aadressil **http://dbiodbs.univ.trieste.it/lichens/Sharnoff_Award**

Võistlustööde esitamise tähtaeg on 31. detsember 2003. a.

Pier Luigi Nimis
IAL president