DRYADICOLOUS MICROFUNGI FROM GREENLAND. 
I. LIST OF SPECIES

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ABSTRACT

Seventeen taxa of microfungi growing on Dryas are recorded from Greenland based on 147 collections. Five of them are new to the archipelago. Lophium igoschiniae Chlebicki sp. nov. is described as a new species, the other four being: Crociirea variable, Gnomonia dryadis, Naemacyclus lambertii var. dryadis, Pseudomassaria islandica and Stomisipelia dryadis. Short descriptions and drawings of diagnostic microscopic features are presented. Lophiotrema macrostomum, Phaeosphaeria vagans, Plesospora pentamera and Scleropelella hyperborea were not previously reported on Dryas from Greenland. Specimens of Stictis mollis reported by Rostrup (1891) in fact belongs to Naemacyclus lambertii var. dryadis.

KEY WORDS: Arctic, Greenland, microfungi, Dryas octopetala, Dryas integrifolia, distribution.

INTRODUCTION

Greenland is the largest Arctic island extending from Cape Farewell 59° 46’ N to Cape Morris Jesup 83° 39’ N. Until the beginning of the twentieth century, Greenland specimens of Dryas were referred to D. integrifolia (Simons 1909). However Nathorst (1888) described D. octopetala f. intermedia and suggested that they might be hybrids between D. octopetala and D. integrifolia. Both species no doubt hybridize in this area (Elkington 1965). The hybrids occur in eastern and northern Greenland but the influence of D. octopetala is reduced westwards (Bay 1992). Elkington (1965) suggested that D. integrifolia immigrated to Greenland from Canada, whereas D. octopetala immigrated across the northern ridge from Svalbard as earlier suggested by Seidenfaden and Sørensen (1937).

Hultén (1937) suspected that so-called ‘Beringia’ as well the High Arctic remained unglaciated and were a major source for recolonization in the Arctic. Ives (1974) and Funder (1979) reported location of ice-age plant refugia in Greenland. Tremblay and Schoen (1999) analysed chloroplast DNA variation in Dryas integrifolia in relation to present-day geographical distribution of population, and to Pleistocene fossil records. The obtained results (Tremblay and Schoen 1999) are compatible with Hultén’s hypothesis. Described haplotypes were restricted to a few locations in Greenland. Refugia along the east coast of Canada and the west coast of Greenland have been postulated on the basis of existence of the high level of genetic diversity along such coastal refugia as well on the basis of the fossil Pliocene records (Tremblay and Schoen 1999). Some examples of Dryas vegetation from northern part of Greenland are showed in Fig. 1 and Fig. 2.


Dryadicolous fungi were reported by Rostrup (1888, 1894, 1904), Lind (1910, 1924, 1926, 1934), Lange (1955), Holm (1979), Knudsen and Borgen (1992) and

**METHODS**

We followed Rostrup's method and searched the collections of *Dryas* in the Greenland herbarium of the Botanical Museum in Copenhagen (C). The plants from 147 collections were screened with a Wild dissecting microscope and afterwards checked in a light microscope Labophot 2. Nikon. A full list of Greenland localities will be reported in the next paper (Chlebicki and Knudsen in prep.). All material mentioned is deposited in C unless otherwise stated. We followed Eriksson (2000) for Latin names of the orders of fungi.

**LIST OF MICROFUNGI REPORTED IN THE LITERATURE FROM DRYAS IN GREENLAND**

*Didymosphaeria dryadis* (Fuckel) Berl. and Voglino (*Pleospora dryadis* Fuckel) on *D. octopetala* and *D. integrifolia*. According to L. Holm (1979) and Aptroot (in...
herb) the records by Lind in 1910 and 1924 are all Wettsteinina dryadis.

Hypodema dryadis Nannf. ex L. Holm mentioned by Holm (1979) on D. octopetala from Kisengaartak, West Greenland.

Isotheca rhytisoides (Berk.) Fr. (Laelastia rhytisoides (Berk.) Sacc.; Hypospila rhytisoides (Berk.) Niessl.; Carlia rhytisoides (Berk.) Kuntze) reported by Rostrup (1888, 1904), Lind (1910) and Cannon (1996) on Dryas integrifolia. Lind (1934) recognized it as a common species in Greenland even up 82° 54' N.

Leptosphaeria dryadophila Huhndorf (= Melanomma dryadis Johansson) was noted on D. integrifolia from Grant Land 82° 30' by Lind (1910).

Melanisia dryadis Rostr. on D. integrifolia was reported by Rostrup (1888, 1904).

Mycosphaerella ootheca (Sacc.) Dearn. (Sphaerella ootheca Sacc.) on D. integrifolia was reported by Rostrup (1888, 1904).

Pleospora herbarum (Fr.) Rabenh. on D. integrifolia was noted by Lind (1928). According to L. Holm and K. Holm (1993) the forms with naked ascosporas should be included in Pleospora helvetica Niessl.

Pyrenophora cerastii (Oudem.) Lind (= Pleospora cerastii Oudem.) was noted on D. integrifolia by Lind (1928). According to L. Holm and K. Holm (1993) large-spored forms with setose ascosporas represent Pleospora helvetica Niessl.

Sclerotoplea hyperborea (Fuckel) L. Holm (Leptosphaeria hyperborea (Fuckel) Berl. and Voglino) was reported by Kobayasi et al. (1971) on D. integrifolia.

Stictis integrifolia Fr. was reported on D. integrifolia by Conners (1967) after Rostrup (1894). However Rostrup (1894) does not have a Stictis integrifolia, but he has a S. mollis Pers. The text goes like this, translated: twigs of Salix glauca: Rode O (Red Island); stems of Dryas integrifolia: Danmarks O (Denmark Island). These three collections, gathered by N. Hartz are deposited in C herbarium. Also Sherwood (1977) not mentioned Stictis integrifolia in her monograph.

Stictis mollis Pers. This widely distributed species (Sherwood 1977) was noted by Rostrup (1891) on D. integrifolia. Examined by us Rostrup's specimens in C herbarium in fact belongs to Naemaculys lambertii var. dryadis.

Wettsteinina dryadis (Rostr.) Petr. (Massaria dryadis Rostr., Pleospora dryadis Petrac non Fuckel) was noted on D. integrifolia (Rostrup 1888) and on Dryas-hybrids (Lind 1924; Conners 1967).

LIST OF INVESTIGATED SPECIES


Host and habitat: on Dryas spp., on the lower side of the leaves, rarely on the upper side.

Description: apothecia 280-360 µm in diam., hairs 10-27 × 3-4 µm, asci 50-54 × 9-10 µm, spores hyaline, 16-20 × 3-4 µm, paraphyses branched, up 50 µm long (Fig. 3A, B, C, D).

Material examined: Ruzi 171, Vatnahverfj, N facing, mossy rock, 10 m elev., 60° 50' N, 45° 24' W, on D. integrifolia, 13 July 1986, J. Feilberg, C 86-5088, Mellemlandet at Narsarsuaq, on D. integrifolia, 22 July 1982, V.B. Mikkelsen, Tunugdliaflir, Mútúukt, 300 m elev., 61° 04' N, 45° 35' W, on D. integrifolia, 30 August 1962, K. Hansen, C. Hansen and P.M. Petersen, C 2218, Julianehab district, Laksefjord, head of Kangerdluarssuk, 60° 52' N, 45° 52' W, on D. integrifolia, 4 July 1978, V. Alstrup, C 78-099, Liverpool Land, Cape Hope, 70° 30' N, 22° 20' W, on D. octopetala (young apothecia), 30 June 1933, T. Sørensen, C 2166.

Comments: A new species to Greenland. Nograsek and Matzer (1991) reported it from Sweden and Austria (the Alps) on Dryas octopetala. Chlebicki (in press) reported it on Dryas octopetala from Poland (the Tatra Mts.), the Polar Urals and on Dryas grandis from the Chukotka Peninsula.

Gnomaonia dryadis Auerst., Mycol. Europ. 5/6: 26, 1869. Diaporthales

Host and habitat: on twigs of Dryas spp.

Description: the typical G. dryadis has spores hyaline, 2-cell., 12-15 × 3-4 µm, with appendages 3-10 µm long (Fig. 3B). Another type has spores 16-20 × 4-5 µm, with, filiform, hyaline appendages up 42 µm long (Fig. 3E).

Material examined: (typical) Julianehab district, West of "Grænsefjord", Kangerdluarssuk, 75 m elev., 60° 57' N, 45° 52' W, on D. integrifolia, 7 July 1978, V. Alstrup, C 78-121. The second type: Julianehab district, Laksefjord, head of Kangerdluarssuk, 60° 52' N, 45° 52' W, on D. integrifolia, 4 July 1978, V. Alstrup, C 78-099.

Comments: Occurrence of typical G. dryadis was reported from Scandinavia, the Alps (L. Holm 1979; K. Holm and L. Holm 1985; Nograsek 1990), the Canadian Arctic (Barr 1959, 1978), Spitsbergen (K. Holm and L. Holm 1993; L. Holm and K. Holm 1994), Tatra Mts., Pyrenees, Yugoslavia (Chlebicki 1995). In some collections from Tatra Mts., Kola Peninsula, Sayan Mts. and Polar Urals (Chlebicki in press) spores with long appendages were present. It is possible that the specimen with bigger spores and long filiform appendages belongs to a separate taxon (Fig. 3E).


Host and habitat: on leaves of D. integrifolia and hybrids.

Material examined: Kangerdluarssuk, 250 m elev., 61° 06' N, 46° 12' W, on D. integrifolia, 7 July 1962, K. Hansen, C. Hansen and P. M. Petersen, C 741, "The land between glaciers", 500 m elev., 60° 57' N, 45° 00' W, on D. integrifolia, 18 July 1978, F. Arndt (only in phanerogam herb.), Wolstenholme Land, Thule, on D. octopetala × integrifolia, 1919, J.N. Nygaard.

Comments: Reported from Kisengaartak in Greenland by L. Holm (1979). It seems to be rare in Europe and restricted to Scandinavia and the northern part of Russia. In Greenland it occurs only in the western and southern part. It indicates its late postglacial colonization of Greenland from west.

Isotheca rhytisoides (Bab. ex Berk.) Fr., Sum. Veg. Scand. 421, 1849. Phyllachorales

Host and habitat: on living leaves of Dryas spp.

Description: Asci clavate, 64-70 × 14-20 µm, spores hyaline, one-celled, 13-14 × 4.6-6 µm (Fig. 4A, B).
Material examined: Kap Morris Jesup, 10 m elev., 83° 39' N, 33° 23' W, on D. octopetala × integrifolia (abundant!), 26 June 1979, S. Funder (only in phanerogam herb.), Igaliq Fjord, Iterlag, 50 m elev., 60° 57' N, 45° 58' W, on D. integrifolia, 29 July 1962, K. Hansen, C. Hansen and P.M. Petersen (only in phanerogam herb.), C 1308. Ymer Isl., Botanikerbugten (Sophia Sound), near sea shore, 0-10 m elev., 73° 10' N, 24° 30' W, on D. octopetala, 18 August 1932, T. Sørensen, C 3175. Germania Land, Sedimentkloft, 100 m elev., 77° 35' N, 21° 30' W, on D. octopetala subsp. punctata, 26 June 1989, D. Boertmann, C. Bay (only in phanerogam herb.).

Comments: The monotypic genus Isothea is restricted to the genus Dryas. It occurs in the whole range of the host plants incl. Dryas octopetala, D. drummondii, D. grandis and D. integrifolia. It is a common and widespread species in Greenland on Dryas octopetala and D. integrifolia, noted by Rostrup (1888, 1904), Lind (1910) and Cannon (1996). The northernmost locality is situated in Greenland near Kap Morris Jesup, 83° 39' N, 33° 23' W (on leaves of D. octopetala × integrifolia). We have found 79 collections, among them 26 on D. octopetala, 10 on D. octopetala subsp. punctata, 19 on D. integrifolia and 24 on hybrids (D. octopetala × integrifolia = D. chamissonis).

Host and habitat: on stems of herbs and twigs and wood of scrubs. Recorded from Rumex, Epilobium, Urtica (Chesters and Bell 1970), Salix reticulata (Nograsek 1990), Ribes
alpinum (Schroeter 1908) and Dryas octopetala (Chlebicki in press). L. Holm and K. Holm (1988) stated that it is frequent on ligneous as well as on herbaceous substrata.

Description: Asci 100-120 × 18-30 μm, spores hyaline to pale brown, 3-4 septate, 32-37 × 6-7 μm (Fig. 4D).

Material examined: Expeditions Danico in Groenlandiam orientalem 1891-92, c. 74° N, on D. octopetala var. minor Hooker, 20 July 1891, N. Hartz, Jameson Land, Mikael Bjerg; 585 m elev., 71° 09' N, 23° 18' W, on D. octopetala, 20 July 1982, C. Bay and B. Fredskild (only one ascocarp on slide!), C 545.

Lophium igoschinum Chlebicki spec. nova, Hystricales

Diagnosis: Hysterothecitis conchiformibus, angustis, irregulariter undulatibus vel pustulatibus, 180-210 μm longis, 140-240 μm alis, cristatis, longitudinali fissura anguste apertentibus, vermculosa, ascis cylindraceis 80-100 × 8-10 μm, ascoporis filiformis, olivaceis, transverse 12-15-septatis, in apicibus obtusis, 78-86 μm longis, 2,6-3 μm crassis. Holotypus in Herb. KRAM depositus. Differ a Lophium mayori hysterothecicus minoribus.

Typus: Russia, the Polar Ural Mts., one km south of Polyarnyj Ural railway station, on veins of lower and upper surface of leaves of Dryas octopetala, 12 July 1995, A. Chlebicki, KRAM-holotype, 43 217.

Etymology: an homage towards the significant contributions of K.N. Igoschina to the investigations of the Polar Urals.

Host and habitat: on dead leaves of Dryas spp.

Description: Ascomata superficial (Fig. 6A, Fig. 7A), conchate, laterally compressed, surface black, irregularly
granular or undulate, apex cristate with longitudinal slit covered by very small papillae (Fig. 7B), asci cylindric 90-97 × 8-9 μm (Fig. 6B), spores filiform (Fig. 6C), with obtuse ends, 12-15-septate, pale yellow 78-86 × 2.6-3 μm, trabeculae sparse, filiform, simple or branched in lower part (Fig. 6D), with thickened ends, in gelatinous matrix.

Additional material examined: Greenland, Liverpool Land, Cape Hope, on leaves of D. octopetala, 4 August 1928, A. Peterson, Russia, the Tchukhtka Peninsula, central part, valley of Tchantalveergyn River, on D. crenulata (= D. incisa × integrifolia), 13 July 1972, Y.P. Kozhevnikov (LE).

Comments: Because of the very scanty material from Greenland, the choice of other appropriate collections was necessary for a description. Thus, the collection from the Polar Ural Mts. was selected.

Only a few papers have dealt with Mytiliniidaeae (earlier Lophiaecae), e.g. Bishy and M.B. Ellis (1952), Zogg (1962), Darker (1963), Sutton (1970) and Barr (1990). So far Lophium mytilinum Pers. : Fr., L. mayori Zogg and L. elegans Zogg were described, all on conifers such as Juniperus, Larix, Pinus and Abies (Zogg 1962). Spores of the new species resemble those of L. mayori, but its apothecia are distinctly smaller. The genus Lophium has conchate ascomata, whereas species with dolabriform ascomata were transferred by Zogg (1962) to the genus Glyphium. L. igoschinae is the first species of this genus which has been found on non-coniferous substrata.

Size of spores according to Zogg (1962):
L. mytilium: (130)170-250(300) × 1-2(2.5) μm,
L. elegans: (200)260-280(300) × 2 μm,
L. mayorii: (60)80-100(110) × 3.4-4(5) μm.


Host and habitat: on upper, rarely lower side of leaves of *Dryas* spp.

*Description:* Ascomata densely covering the leaf, spores hyaline, 1-septate, 21-22 × 9.10 μm (Fig. 4C).


*Comments:* Some species of the genus have been described or reported from *Dryas* leaves: *Mycosphaerella dryadicola* (Rostrup) Munk (L. Holm 1979), *Mycosphaerella biberwieriens*is (Auerswald) Lindau (Tomilin 1979; Vasilyeva 1987), *M. octopetalae* (Oudemans) Lind (Lind 1934; L. Holm 1979), *M. ootheca* (Saccardo) Magnus (Lind 1934), *M. minor* (P. Karsten) Johanson (K. Holm and L. Holm 1993), and *M. punctiformis* (Pers. : Fr.) Starbäck (Nograsek 1990). Of them *Mycosphaerella ootheca* was reported from Ellesmere Island (Lind 1934). Tomilin (1979) synonymized it with *M. dryadis*, but the spores of *M. ootheca* as described by Saccardo (1882) are somewhat shorter than those of *M. dryadis* described by Auerswald (1869) and reported by Vasilyeva (1987) (Table 1). We
TABLE 1. Spores of species of *Mycosphaerella* reported from *Dryas*.

<table>
<thead>
<tr>
<th>Species</th>
<th>Spore length × width (µm)</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>M. biberwieriensi</em></td>
<td>12-14 × (2)2.5-3</td>
<td>Tomlin (1979), Vasileyeva (1987)</td>
</tr>
<tr>
<td><em>M. dryadis</em></td>
<td>18 × 4</td>
<td>Auerwald (1869)</td>
</tr>
<tr>
<td></td>
<td>20-26 × 6-7</td>
<td>Vasileyeva (1987)</td>
</tr>
<tr>
<td><em>M. octopetalae</em></td>
<td>21 × 7-9</td>
<td>Oudemans (1885)</td>
</tr>
<tr>
<td></td>
<td>20-25 × 8-10(11)</td>
<td>Holm L. (1979)</td>
</tr>
<tr>
<td></td>
<td>20-26 × 8-10</td>
<td>Vasileyeva (1987)</td>
</tr>
<tr>
<td><em>M. ootheca</em></td>
<td>15-16 × 6-7</td>
<td>Saccardo (1882)</td>
</tr>
<tr>
<td><em>M. minor</em></td>
<td>10-12 × 3-4</td>
<td>Vasileyeva (1987)</td>
</tr>
<tr>
<td><em>M. punctiformis</em></td>
<td>6-9 × 2-3</td>
<td>Vasileyeva (1987)</td>
</tr>
</tbody>
</table>

have found 11 collections, among them three on *D. integrifolia*, six on *D. octopetalus* and two on *D. octopetalus subsp. punctata*.

The spores of *M. octopetalus* from Greenland were similar to those from Novaya Zemlya.


Rhytismatales

Host and habitat: on the lower side of twigs of *Dryas* spp.

Description: Apothecia white, circular, spores filiform, septate.

Material examined: The triennial Danish Expedition to East Greenland, Hold Wild Hope, South Coast, 100-200 m elev., 73° 30' N, 20° 40' W, on *D. octopetalus*, 12 August 1924, T. Sørensen, (only in phanerogam herb.), C 5336. Scoresby Sund, on *D. octopetalus*, September 1891, N. Hartz (only in phanerogam herb.).

Comments: The species was noted in the Alps (K. Holm and L. Holm 1985; Nograsek and Matzer 1991), Sweden (Nograsek and Matzer 1991), Spitsbergen (K. Holm and L. Holm 1993), the Polar Urals, Taimyr Peninsula and Chukotka Peninsula (Chlebicki in press).

Rostrup (1891) reported a similar species *Stictis mollis* Pers. from Greenland, but in fact it is *Naemacyclus lamberti* var. *dryadis*. However, true members of the genus *Stictis* have been noted on *D. octopetalus*. *Stictis radiata* Pers. subsp. *radiata* was recorded by Nograsek and Matzer (1991) from the Alps. K. Holm and L. Holm (1993) reported the occurrence of *Stictis* sp. from Spitsbergen. There are some taxonomical problems related to the genus *Naemacyclus* Fucckel. According to DiCosmo et al. (1984) *Naemacyclus* and *Lasioiistictis* (Sacc. and Berlese) Sacc. represent the same taxon.


Host and habitat: on pedicels of various herbaceous plants (Farr et al. 1989).

Description: Asccarps c. 240 µm in diam., spores pale brown, 27-30 × 9-11 µm, with a gelatinous coating up to 2 µm thick (Fig. 5A).

Material examined: Ella O; Solitairebugt, c. 100 m elev., 72° 52' N, 25° 10' W, on *D. octopetalus*, 24 August 1958, S. Laegaard, C 1319.

Comments: Widely distributed in Fennoscandia (O.E. Erikssson 1967), noted also on many host plants in temperate regions of the world (Farr et al. 1989).

Fig. 7. *Lophium igoschiae*: A – hysterothecium, B – central part of slit. SEM microphotographs.
Host and habitat: on leaves and hypanthium of various herbaceous plants.
Description: Asccarps with hairs up to 100 μm long, but sometimes asccarps were naked. Spores muriiform, pale brown, 28-34 × 13-15 μm (Fig. 5B).
Material examined: Heilprin Land, Klarese, 82° 10' N, 30° 30' W, on D. octopetala × integrifolia, 29 June 1963, B. Fredskild, C 2486.
Comments: We have found it in eight collections, among them two on D. integrifolia, one on D. octopetala subsp. punctata and five on hybrids. It is a plurivorous species (Farr et al. 1989), reported on D. integrifolia from Canada by Barr (1959). Chlebicki (in press) observed it on almost all species of Dryas. The northernmost locality of this fungus is situated in Heilprin Land, Klarese, 82° 10' N.

Pleospora penicillus (J.C. Schmidt : Fr.) Fuckel var. ambiguia (Brl. and Bres.) Crivelli, Diss. ETH. 7318: 75, 1983. Dothideales
Host and habitat: on leaves and hypanthium of various herbaceous plants.
Description: Spores pale brown, muriiform, with distinctly paler upper cell, 24-29 × 11-11.5 μm (Fig. 5D).
Material examined: South coast of Independence Fjord, Neergård Elv, 82° 00' N, 26° W, on D. octopetala × integrifolia, 8 March 1949, Å. Sahliert (only in phanerogam herb.), C 9500. Scoresbysund, Denmark, 50° 15.5, 5 August 1951, Behrendt Andersen.
Comments: L. Holm and K. Holm (1993) recognized a large-spored Pleospora with 7-septate spores and having a length/width ratio generally > 2 like P. helvetica. It occurs in temperate regions (Farr et al. 1989) as well as in the Arctic (L. Holm and K. Holm 1993). Chlebicki (in press) noted it on all species of Dryas.

Host and habitat: on hypanthium of various herbaceous plants.
Description: Spores light brown (gold), muriiform, 20-23 × 9-11 μm, with gelatineous coating (Fig. 5C).
Comments: It is a variety characterized by spores with constantly five transversal septa and one longitudinal septum (L. Holm and K. Holm 1993). P. penicillus var. penicillus was also noted in the Alps (Crivelli 1983; Norgaek 1990).

Syn.: Clathrospora pentamera (P. Karst.) Berl., Graphyllum pentamenum (P. Karst.) Barr.
Host and habitat: on pedicels of Dryas octopetala (see comments).
Description: Asccarp 230 μm diam, papilla c. 30 μm high and 70 μm diam., spores pale yellowish brown, 4-septate, with one longitudinal septum in mid cells, 26-30 × 12-14 μm, devoid of mucous envelope (Fig. 4E).

Material examined: Scoresbysund, 10-00 m elev., 70° 29' N, 21° 58' W, on D. octopetala, 14 July 1983, B. Fredskild.
Comments: It occurs on various angiosperms. Barr (1959, 1990) reported it from Canada (on D. integrifolia) and USA, O.E. Eriksson (1967) cited localities in Sweden, Norway and Russia (but not on Dryas). K. Holm and L. Holm (1993) stated that it is a common species in Spitsbergen on various herbs and reported some findings on Dryas wood. Conners (1967) mentioned this species from Greenland, reported on Cerasium, Gentiana and Carex spp. by Rostrup (1894, 1888) and Lind (1924). It seems to be a common species in the Arctic. M. Barr (in litt.) wrote that: Clathrospora pentamera (Karst.) Berlese was placed in Graphyllum by Barr (1990) and Comocladthia by Shoemaker and Babcock (1992). I would be more cautious now about assigning collections to species of Pleospora.

Host and habitat: on leaves of Dryas spp.
Description: Spores hyaline, 1-septate, 21-25 × 8-9 μm (Fig. 4F).
Comments: We have found it on two collections of D. octopetala and seven collections of D. integrifolia. Ascomata of investigated specimens were devoid of setae. P. islandica is a common species with an amphi-atlantic distribution.

Host and habitat: on leaves and hypanthium of Dryas spp. and Cassiope tetragonae (Barr 1959; L. Holm 1975; Chlebicki in press).
Description: Spores brown, 3-septate, 19-20 × 7-8 μm (Fig. 4G).
Comments: We have noted it in four collections of D. octopetala, one collection of D. integrifolia and three collections of hybrids. It is a species with a distinct circum-polar type of distribution, becoming more common northwards. The dark coloured spores are probably an adaptation to colonization of the High Arctic with the strong influx of light S. hyperborea belongs to the ericaceous fungi. Chlebicki (1995) noted that the proportion of ericaeous microfungi on Dryas increases towards the North.

Host and habitat: on petioles, twigs and leaves of Dryas spp.
Material examined: Ruiz 171, Vatnahrverfi, V-facing, mossy rock, 10 m elev., 60° 50' N, 45° 24' W, on D. integrifolia, 13 July 1986, J. Feilberg, C 86-5088.
Comments: We have found it in three collections of D. integrifolia, one collection of D. octopetala subsp. punctata and one on a hybrid. It is another species with an ericaceous origin, reported from arctic as well as alpine areas of the Northern Hemisphere (Holm 1979; Barr 1955; Nogresek 1990; K. Holm and L. Holm 1993; Chlebicki 1995).

Wettsteinia dryas (Rostr.) Petr., Sydowia 1: 322, 1947. Ditholeales

Host and habitat: on leaves of Dryas spp.

Description: Ascomata scattered on upper side of leaf, spores at first hyaline, surrounded by a gelatinous coating, finally becoming 3-septate and pale brown (Fig. 5E).


Comments: We have noted it in 15 collections of D. octopetala subsp. punctata, 11 collections of D. integrifolia, 12 collections of D. octopetala and 19 collections of hybrids. It is a widespread species in arctic and alpine regions of the Northern Hemisphere.

CONCLUSION

Greenland is a very important place from the biogeographical point of view. No doubt the waves of migrational plants from the East as well from the West were stopped here. More detailed data will be available in a forthcoming paper.

LITERATURE CITED


GRZYBY MIKROSKOPIJNE ZEBRANE NA DĘBIKACH W GRENLANDII.
I. LISTA GATUNKÓW

STRESZCZENIE

Praca jest poświęcona grzybom mikroskopijnym występującym na dębkach Dryas octopetala i Dryas integrifolia w Grenlandii. W przeglądanych materiałach z Grenlandii, zdeponowanych w zbiorze Muzeum Botanicznego w Kopenhadze (C) odnotowano występowanie 17 taksonów. Nowe dla Grenlandii okazały się następujące gatunki: Crociocreae variabile, Gonomaeta dryadyis, Lophium igersheimiae, Naemoclysmus lamartii var. dryadis, Pseudomassaria islandica i Stomiopletis dryadis. Natomiast Lophostoma macrostomum, Phaeosphaeria vagans, Pleospora pentamera i Scleropleella hyperborea nie były dotychczas podawane z Grenlandii na dębkach.

SŁOWA KLUCZOWE: Arktyka, Grenlandia, grzyby mikroskopijne, Dryas octopetala, Dryas integrifolia, rozmieszczenie.