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Notes on Icelandic Myxomycetes

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ABSTRACT: During one month of field work in 1984 Myxomycete fructifications and samples for moist chamber culture were collected at 20 localities in Iceland. From this material and some recent collections from AMNH 32 species and one variety have been identified. 18 species and one variety are recorded as new to Iceland. Notes on the distribution of myxomycetes in Iceland are added. At present *Arcyria cinerea*, *A. incarnata*, *Comatricha nigra*, *Echinostelium brooksii*, *E.minutum* and *Lycogala epidendrum* are considered to be ubiquists. The possible reasons for the apparently limited distributions of *Badhamia macrocarpa*, *Echinostelium corynophorum* and *Trichia decipiens* are discussed.

While some groups of fungi, particularly the Basidiomycetes and the pathogenic fungi, have been investigated in some detail in Iceland, other groups seem more or less overlooked. One of these is the Myxomycetes. A preliminary study of the Icelandic slime-moulds (GØTZSCHE, 1984) clearly revealed this fact. Based on unpublished material from the Museum of Natural History, Akureyri (AMNH), specimens from the Institute of Biology, University of Iceland, Reykjavík, a few collections by the author and the existing literature, only 28 species were recorded, and concerning distribution and frequency of the species within the country only vague suggestions could be made.

Areas comparable to Iceland and with a more intensively investigated Myxomycete flora may be hard to find. However, if interpreted cautiously, studies such as those of HJORTSTAM and JOHANNESEN (1980) from central Norway and SCHINNER (1983) from northern Sweden do suggest a much richer Icelandic flora than presently known.

In the light of this, field work in Iceland was undertaken with the main purpose to provide some basic knowledge about distribution and frequency of the more common species, and of course, to record as many new species as possible for the country. The field work took place in August 1984 and the re-

sults hereof are presented in this paper. In addition, a number of recent collections from AMNH, mostly by Helgi Hallgrímsson, are included.

MATERIALS AND METHODS

During the field work 139 collections, representing 22 taxa, were collected at 17 localities. Additionally, 185 samples for moist chamber culture were gathered at 20 localities. The moist chambers yielded another 128 collections of 20 taxa. Of the 185 cultures established 88 or ca. 46% produced myxomycete fructifications, a result comparable to that obtained by HÄRKÖNEN (1977a) for southern Finland. Generally, the moist chambers were maintained for at least 10 weeks with daily inspections at the beginning, later on with gradually longer intervals. Samples producing Myxomycetes were kept until production ceased. In a few cases moist chambers containing active plasmodia were maintained for up to six months. Collections obtained by the moist chamber method were often scarce and in many cases the material is only preserved on slides embedded in polyvinyl alcohol. This is the case with most collections of *Echinostelium* species.

Specimen citations are provided for critical taxa only and are given as: "*HFG 000*" for field collections of the author and "*HFG C000-0*" for moist chamber collections. The AMNH collections are cited as "*AMNH 0000*". Spore-dimensions, exclusive of ornamentation, are given as: smallest spore measured, mean, largest spore measured. 25 spores were measured per collection. Nomenclature follows MARTIN and ALEXOPOULOS (1969) and NANNENGA-BREMEKAMP (1974). The material collected by the author is deposited at the Botanical Museum, University of Copenhagen (C), and duplicates of some of the collections at AMNH. Those of Helgi HallgrÀmsson are deposited at AMNH.

LOCALITIES

The localities at which Myxomycete fructifications or samples for moist chamber culture were collected are shown on the map, fig. 1.

1 Gullbringusýsla, Reykjavík, park at lake, 64°08'N, 21°57'W, ca 10 m alt.
2 Borgarfjarðarsýsla, Borgarfjörður, Hafnarskógur, 64°30'N, 21°58'W, 5-10 m alt.
3 Borgarfjarðarsýsla, Húsafellsskógur, 64°43'N, 20°55'W 100-200 m alt.
4 Mýrasýsla, Hallkelsstaðaheiði, between Kolsstaðir and Hallkelsstaðir, 64°44'N, 20°55'W, 200-250 m alt.
5 Mýrasýsla, Hreðavatn, slope W of the lake, 64°46'N, 21°36'W, 100-150 m alt.
6 A.-Húnavatnssýsla, Bólstaðarhlíð, at road 1, S of point 466, 65°24'N, 19°45'W, ca 400 m alt.
7 Eyjafjarðarsýsla, Garðsárgil, 65°36'N, 18°00'W, 50 m alt.
8 S.-Þingeyjarsýsla, Vaglaskógur, 65°43'N, 17°53'W, 150-200 m alt.
9 S.-Þingeyjarsýsla, Ljósavatn, slope N of the lake, 65°43'N, 17°41'W, 150-200 m alt.
10 S.-Þingeyjarsýsla, Goðafoss, 65°41'N, 17°33'W, ca 120 m alt.
11 S.-Þingeyjarsýsla, Laxá, Hrókvörðugil ca 1 km NW of Helluvað, 65°36'N, 17°11'W, ca 250 m alt.

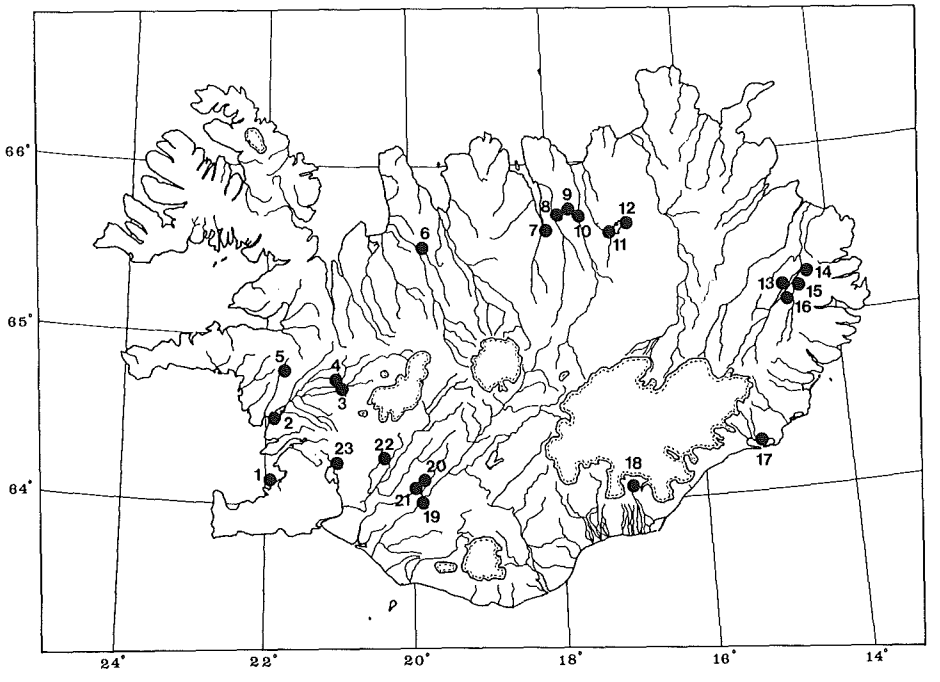

Fig. 1. Localities at which Myxomycete fructifications or samples for moist chamber culture of Myxomycetes were collected for this study.

12 S.-Þingeyjarsýsla, Mývatn, Hlíðarkambur, 65°38'N, 16°54'W, 280-300 m alt.
13 N.-Múlasýsla, Droplaugarstaðir, 65°09'N, 14°43'W, 20-80 m alt.
14 S.-Múlasýsla, Egilsstaðaskógur, 65°16'N, 14°23'W, 50-100 m alt.
15 S.-Múlasýsla, Eyjólfstaðaskógur, 65°11'N, 14°28'W, ca 200 m alt.
16 S.-Múlasýsla, Hallormsstaðarskógur, 65°05'N, 14°45'W, 50-100 m alt.
17 A.-Skaftafellssýsla, Höfn, at the camping ground, 64°15'N, 15°14'W, ca 10 m alt.
18 A.-Skaftafellssýsla, Skaftafell National Park, 64°01'N, 17°00'W, 100-300 m alt.
19 Rangárvallasýsla, Merkurhraun, forest S of road 26 near the abandoned farm Merkihvoll, 64°02'N, 19°53'W, ca 150 m alt.
20 Árnessýsla, Gnúpverjahreppur, S-slope of Mt. Dímon, 64°07'N, 19°55'W, ca 220 m alt.
21 Árnessýsla, Gnúpverjahreppur, S of Mt. Skriðufell, 64°07'N, 19°56'W, ca 200 m alt.
22 Árnessýsla, Biskupstungur, W-slope of Mt. Bjarnarfell, 64°19'N, 20°23'W, 350-450 m alt.
23 Árnessýsla, Þingvallaskógur, 64°16'N, 21°05'W, ca 250 m alt.

HABITATS AND SUBSTRATES

Woods which are not too intensively managed are generally considered the primary habitats for Myxomycetes, because suitable substrates such as rotten wood and branches are usually abundant. Realizing that the full scale of potential Myxomycete habitats offered in Iceland could not be covered in

one month, it was decided to concentrate the field work on natural woodlands.

The only indigenous forest-forming tree in Iceland is *Betula pubescens* Ehrh. subsp. *tortuosa* (Ledeb.) Nyman (in this paper referred to as *B. pubescens*). It follows that the selection of substrates is more or less restricted to material of this species, mostly in the form of rotten wood, branches on the ground and bark or litter for moist chamber culture. This is the case for localities 2, 3, 4, 5, 9, 12, 14, 18, 19, 21, 22 and 23, and partly so for localities 8 and 16. Interspersed among the birches, there are often various other broad leaved trees and shrubs such as *Salix glauca* L., *S.phylicifolia* L. and *Sorbus aucuparia* L.

In many places in Iceland coniferous trees have been grown for decades. Most common is *Larix russica* (Endl.) Sabine ex Trautv.,(syn.: *L. sibirica* Ledeb.), but also several species of *Pinus* and *Picea*, e.g. *Picea glauca* (Moech) Voss are cultivated. Collections were made in a few of these plantations, viz. localities 8, 16, 17 and 20.

Trees thrive in the mild climate of the southwest or in sheltered places in the North and East only. On more exposed sites among other vegetation types one finds dwarf shrub heaths. Localities 6, 10, and 11 represent such habitats, from where only samples for moist chamber culture were collected. The material includes leaf litter and twigs from several species e. g. *Betula nana* L., *Calluna vulgaris* (L.) Hill, *Arctostaphylos uva-ursi* (L.) Sprengel and *Empetrum hermaphroditum* Hagerup.

LIST OF SPECIES

ARCYRIA CINEREA (Bull.) Pers.

Material studied: 12 field collections, all on rotten wood or branches of *B. pubescens*. 17 moist chamber collections, ten on bark of *B. pubescens*, three on twigs of *B. nana*, two on litter of *Pinus* sp., one on litter of *C. vulgaris* an one on twigs of *S. phylicifolia*.

Locality: 3-6, 8, 10-12, 16, 18, 19, 21-23.

New to Iceland.

ARCYRIA INCARNATA (Pers.) Pers. (Fig 4).

Material studied: 35 field collections, 34 on rotten wood or branches of *B. pubescens* and one on unidentified, rotten wood. Two moist chamber collections, both on bark of *B. pubescens*.

Locality: 2-5, 9, 12, 13 (*AMNH 10236, 11462*), 14, 15 (*AMNH* s.n.), 16, 18-23.

Previously recorded from 4 localities in Iceland.

ARCYRIA INCARNATA (Pers.) Pers. var. *HELVETICA* Meylan (Fig. 2).

Material studied: Loc. 1, *HFG 800*, in moss on rotten stump of *B. pubescens*.

New to Iceland.

Sporangia gregarious, shortly stalked, total height up to 1.4 mm, globose to slightly pyriform, 0.5-1.0 mm in diam., brick red. Hypothallus rather tough, dark reddish brown. Stalk up to 0.4 mm high, dark reddish brown, reddish orange in transmitted light, filled with spore like cells which are ca. 15 µm in diam. at base and ca. 8 µm above. Peridium very fragile, but partly persistent, with faint bronze iridescence, cup sharply delimited, more or less hemispherical, plicate, marked on the inside with extremely fine warts which coalesce to form a delicate reticulum (oil imm.), pale orange in transmitted light. Capillitium a close-meshed net of 2.5-4 µm wide tubules, marked with rings, half-rings and warts, finely spinulose all over, golden yellow in transmitted light, fixed mainly at base of cup but also with few tubules attached to side of cup, hardly expanding. Spores globose, 6.7-7.2-7.7 µm in diam., smooth with very faint, scattered warts or groups of warts, brick red in mass, pale yellowish in transmitted light.

MEYLAN (1910) erected this variety for a single collection having globose sporangia, persistant and iridescent peridium and with non elastic capillitium attached mainly at the base of the cup. After examining Meylan's material, KOWALSKI (1975) concluded that the form was influenced by unfavourable conditions during maturation and thus should not be recognized unless more and better material confirmed its identity. My own observations of the type collection confirms those of Meylan and Kowalski. Although the material does contain some prematurely dried sporangia, several properly matured sporangia are also present. The characteristics of these do, in my opinion, suffice at least for varietal recognition.

The Icelandic collection, although small, is perfectly matured and agrees well with the description given by Meylan.

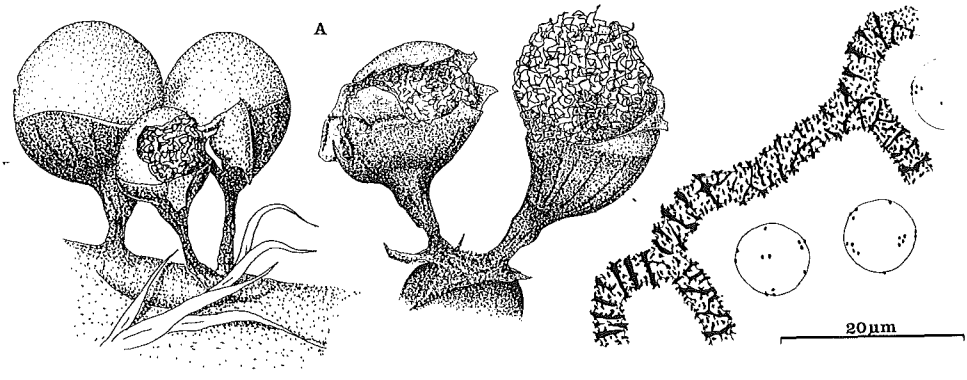

Fig. 2. *Arcyria incarnata* (Pers.) Pers. var. *helvetica* Meylan. A. Sporangia, *HFG 800*. B. Part of capillitium and spores, *HFG 800*.

BADHAMIA UTRICULARIS (Bull.) Berk.
Material studied: Loc. 9, *HFG C586-3*, on bark of dead *B. pubescens*. Loc. 13, *AMNH 10255*, on rotten branch. Loc. 19, *HFG 790*, on rotten branch of *B. pubescens*.
New to Iceland.

Both *HFG* collections have loosely clustered, rather small spores, 7.7-9.3-10.8 µm in *HFG 790* and 8.8-9.9-11.3 µm in diam. in *HFG C586-3*. The latter collection is completely devoid of lime. Otherwise typical.

CALOMYXA METALLICA (Berk.) Nieuwl.
Material studied: One field collection on branches of *B. pubescens* and one moist chamber collection on twigs of *Salix* sp.
Locality: 11, 22.
New to Iceland.

CERATIOMYXA FRUTICULOSA (Müll.) Macbr.
Material studied: two field collections on rotten wood or bark of *B. pubescens*.
Locality: 3.
New to Iceland.

COMATRICHA ELLAE Härkönen
Material studied: Loc. 10, *HFG C570-3*, on twigs of *B. nana*.
New to Iceland.

A scanty collection of four tiny sporangia. The surface net is somewhat fragmentary, otherwise the collection agrees very well with the description given by HÄRKÖNEN (1977b). Spores are brown with reddish tint in mass, pale brownish in transmitted light, 7.7-8.9-9.8 µm in diam. and finely and regulary warted.

COMATRICHA LAXA Rost.
Material studied: Eight field collections, all on decaying wood or branches of *B. pubescens*, and two moist chamber collections, both on bark of *B. pubescens*.
Locality: 2-5, 14, 18, 19, 21.
New to Iceland.

In the common delimitation *C. laxa* is a very variable species (e.g. MARTIN & ALEXOPOULOS 1969). It is generally characterized by the ovate to short cylindric sporangia having a rather open capillitial net with more or less horizontal primary branches. In these characters, however, it gradually merges into *C. nigra* on one hand and into species such as *C. longipila* Nann.-Brem. on the other. In particular, small forms of *C. laxa* and *C. nigra* may be difficult to distinguish unless they are accompanied by larger and more typical sporangia. A rather flexible species concept of *C. laxa* is also adopted in this study with the main emphasis on the open capillitial net with horizontal primary branches.

Two collections from loc. 16 and 18 (*HFG 347* and *343*) previously attributed to *C. nigra* (GØTZSCHE 1984) have proved to belong here.

COMATRICHA NIGRA (Pers.) Schroet.

Material studied: 15 field collections, one on rotten wood of *Salix* sp. and the rest on decaying wood or branches of *B. pubescens*. Two moist chamber collections. One on bark and twigs of *B. pubescens* and one on twigs of *B. nana*.

Locality: 1, 3-5, 9, 12, 14, 18, 20-23.

Typical specimens of *C. nigra* are characterized by globose to ovate sporangia with notably dense capillitial net and branches with only few, if any, free ends at the perifery. The primary capillitial branches form an angle of 50 to 80 degrees with the columella. In small sporangia primary branches may be few and the capillitium often seems less dense.

Earlier reported from Iceland by LARSEN (1932) and erroneously by GØTZSCHE (1984) (see *C. laxa*).

CRATERIUM LEUCOCEPHALUM (Pers.) Ditmar

Material studied: Loc. 17, *HFG 674*, on leaf of *Salix* sp.; *HFG 675*, on branch of *P. glauca*; *HFG 676*, on twigs of *B. pubescens*.

Like the specimens previously recorded for Iceland (GØTZSCHE, 1984) these collections fit var. *scyphoides* (Cooke and Balf.) G. Lister which is characterized by globose to obovoid sporangia and spores which are slightly larger, darker and more prominently ornamented than var. *leucocephalum* (NANNENGA-BREMEKAMP 1974).

The spores of *HFG 674* are 8.2-8.8-9.3 µm in diam. and finely spinulose. In spore-size this collection approaches var. *leucocephalum*. MARTIN and ALEXOPOULOS (1969) do not recognize any of the varieties described for the species because of intervarietal gradations, even within single fructifications. All Icelandic collections appear constant.

ECHINOSTELIUM BROOKSII Whitney

Material studied: 25 moist chamber collections, 20 on bark of *B.pubescens*, three on bark of *Pinus* sp. and two on bark of *L. russica*.

Locality: 3, 5, 8, 14, 16, 21, 23.

Previously reported from loc. 16 (GØTZSCHE 1984).

All collections agree with the description by WHITNEY (1980) except that the spores are smaller, 8.2-9.8-12.9 µm in diam. (mean calculated from 19 collections) and rarely a thinner area in the wall can be seen, and only if very carefully examined (oil imm). In these characters the Icelandic collections are constant. Spores with two or four protoplasts, often mixed with normal spores, are quite frequent in the material.

ECHINOSTELIUM CORYNOPHORUM Whitney (Fig. 6).
Material studied: Nine moist chamber collections, seven of these on bark of *B. pubescens*, one on bark of *L. russica* and one on bark of *Pinus* sp.
Locality: 8, 9, 12, 16.

Previously known from one locality in Iceland.
As for *E. brooksii*, the Icelandic material of *E. corynophorum* has constantly smaller spores, 8.2-9.4-12.9 µm in diam., than given by WHITNEY (1980).

ECHINOSTELIUM MINUTUM de Bary (Fig. 5).
Material studied: 36 moist chamber collections. 22 on bark of *B. pubescens*, five on litter of *Pinus* sp., two on litter of *A. uva-ursi*, litter of *C. vulgaris* and twigs of *B. nana*, respectively and one on litter of *E. hermaphroditum*, litter of *P. glauca*, bark of *Salix* sp. and bark of *S. phylicifolia*, respectively.
Locality: 1, 3-6, 8, 10, 16, 18-23.

Previously known from one locality in Iceland.
All except one of the 1984 collections of this species have white spores, delicately spinulose with areas of slightly more prominent spines (articular surfaces) and 4.6-6.8-9.8 µm in diam. (mean calculated from 35 collections). The articular surfaces are visible only if the spores are stained in lactophenol with cotton blue. One collection, *C543-1* from locality 16, has also white spores, but larger, 8.7-9.4-10.3 µm in diam., with distinct articular surfaces and perfectly smooth all over. Reexamination of two collections earlier reported as having "smooth to very delicately punctured" spores (GØTZSHE 1984), revealed that they, too, had smooth spores. So, it seems that the Icelandic material falls in two groups distinguished by spore size and ornamentation, but apparently not correlated to other morphological characters or spore colour.
This is to some extent contradictory to the results of other students (f. ex. MARTIN 1960 and WHITNEY 1980) who, when discussing possible subspecific taxa in *E. minutum* usually stress spore colour, white versus pink, as the main distinguishing character.

ENERTHENEMA PAPILLATUM (Pers.) Rost.
Material studied: Seven field collections, all on rotten wood or branches of *B. pubescens*. One moist chamber collection on bark of *B. pubescens*.
Locality: 4, 5, 7 (*AMNH 9795*), 19, 21, 22.
New to Iceland.

ENTERIDIUM OLIVACEUM Ehrenb.
Material studied: Six field collections, all on rotten wood or branches of *B. pubescens*.
Locality: 4, 5, 12, 14, 22.
First reported by ROSTRUP (1903) from loc. 3.

ENTERIDIUM SPLENDENS (Morgan) Macbr. var. *JURANA* (Meylan) Härkönen

Material studied: Loc. 16, *HFG 679*, on rotten stump of *B. pubescens*; *HFG 687*, on rotten wood of *B. pubescens*, leg. S. A. Elborne.

New to Iceland.

Some authors (f. ex. MARTIN and ALEXOPOULOS 1969 and NANNENGA-BREMEKAMP 1974) accept *E. splendens* var. *splendens* and var. *jurana* (Meylan) Härkönen as distinct species, based on differences in peridial and pseudocapillitial structure. Others (f.ex. KOWALSKI 1975 and HÄRKÖNEN 1979a) do not find the differences sufficient for specific recognition.

HFG 679 has fragile, evanescent peridium and lax pseudocapillitium typical of var. *jurana*. *HFG 687* takes an intermediate position, having partly persistant peridium and a pseudocapillitium of rigid, perforated plates near hypothallus and peridium as in var. *splendens*, but rather thin and lax pseudocapillitial threads in the interior of the aethalium.

LAMPRODERMA ARCYRIOIDES (Sommerf.) Rost.

Material studied: One field collection on rotten wood of *B. pubescens* and on moss.

Locality: 16.

Previously known from three localities in Iceland.

LEOCARPUS FRAGILIS (Dicks.) Rost.

Material studied: One moist chamber collection on litter of *E. hermaphroditum*.

Locality: 10.

One earlier report from Iceland (GØTZSCHE 1984).

LICEA MARGINATA Nann.-Brem.

Material studied: Eight moist chamber collections, all on bark of *B. pubescens*.

Locality: 16, 18, 23.

New to Iceland.

LICEA MINIMA Fries

Material studied: Five moist chamber collections, all on bark of *B. pubescens*.

Locality: 3, 4, 6, 16.

New to Iceland.

On the authority of the present author (GØTZSCHE 1987) the material reported here was adopted in the checklist of Icelandic Myxomycetes (HALLGRÍMSSON 1988) as *Licea testudinacea* Nann.-Brem. However, a later revision and comparision with similar material from Greenland revealed a better agreement with *L. minima*. The spores of all the Icelandic collections are brown in mass, pale to medium greyish brown in transmitted light with a sharply delimited paler area and 9.3-10.8-12.4 µm in diam. The peridium is divided into 3-8 platelets.

LICEA PARASITICA (Zukal) Martin
Material studied: Three moist chamber collections, all on bark of *B. pubescens*.
Locality: 2, 5.
New to Iceland.

LYCOGALA EPIDENDRUM (L.) Fries
Material studied: 22 field collections, one on moss on a stump of *B. pubescens* and the rest on rotten wood and bark of *B. pubescens*.
Locality: 2-5, 8, 9, 12, 14, 16, 18-21.
Previously recorded from eight localities (HALLGRÍMSSON 1960, GØTZSCHE 1984)

MUCILAGO CRUSTACEA Wiggers
Material studied: Loc. 13, *AMNH 10054*, in grass vegetation; *AMNH 12134*, in grass near cow dung.
Previously reported by HALLGRÍMSSON (1960) and GØTZSCHE (1984).

PARADIACHEOPSIS CRIBRATA Nann.-Brem.
Material studied: Loc. 5, *HFG C617-3*, on bark of *B. pubescens*.
New to Iceland.

Characterized by the stout capillitium, branching more or less dichotomously, one to four times from columella to peridium. The ultimate branches are spiny and arch along the periphery where they occasionally form anastomoses. The columella of *HFG C617-3* invariably reaches the centre of the sporangium where it splits into the main capillitial branches. Minor branches also arise along the whole length of the columella. Spores are 9.3-11.0-12.5 µm in diam., which is smaller than given by NANNENGA-BREMEKAMP (1974).

PERICHAENA CHRYSOSPERMA (Currey) A. Lister
Material studied: One moist chamber collection on leaf litter of *B. pubescens*.
Locality 8.
New to Iceland.

PHYSARUM cf. *CARNEUM* G. Lister & Sturgis
Material studied: Loc. 23, *HFG 766A*, in moss, leg. S. A. Elborne.
Sporangia scattered, stalked, total height 0.7-0.8 mm, globose to depressed globose, 0.4-0.5 mm in diam., very pale brownish yellow, with slight iridescence when lime is scarce. Hypothallus discoid, pale reddish. Stalk cylindric, longitudinally furrowed, mostly slender, but in a few sporangia rather stout, 0.2-0.4 mm high, reddish orange, translucent, ochraceous in transmitted light. Peridium membranous, hyaline in transmitted light, on the outside impregnated with pale brownish yellow lime, often massed in more or less pulvinate scales, base of peridium usually tougher, reddish brown. Capillitium of thin, hyaline tubules, nodes more or less

angular, up to 30-40 µm large, filled with white lime granules. Columella not observed. Spores globose, 8.2-9.0-9.8 µm in diam., with irregularly distributed, apparently blunt spines up to ca. 1 µm high, dark brown to almost black in mass, medium to dark brown with purplish tint in transmitted light, occasionally slightly paler on one side. Immature sporangia whitish.

The specimen was collected as whitish, immature sporangia and then forgotten in a box for a few days, after which most sporangia appeared mature and were allowed to dry.

Microscopically most sporangia show no indication of premature drying, but partial coalescence of the peridial lime may be due to disturbance during maturation. The pulvinate lime scales and the colour, which is pale for *P. carneum*, makes the determination uncertain. Habitually the Icelandic material is very close to fig. 214b in LISTER (1925), except that the peridial lime is more yellowish.

PHYSARUM FAMINTZINII Rost.
Material studied: Loc. 16, *AMNH 12008*, on needles and twigs of *Picea engelmanii* in nursery.
New to Iceland.

STEMONITIS FLAVOGENITA Jahn
Material studied: Four field collections, two on rotten wood of *B. pubescens*, one on twigs of *L. russica* and one on dry grass leaves.
Locality: 3, 14, 16, 18.
Earlier reported from loc. 16 (GØTZSCHE 1984).

STEMONITIS FUSCA Roth
Material studied: One field collection on twigs and leaves of *Salix* sp.
Locality: 8.
Reported from the same locality by GØTZSCHE (1984).

TRICHIA BOTRYTIS (J. F. Gmel.) Pers.
Material studied: Six field collections, all on rotten wood or branches of *B. pubescens*.
Locality: 2, 5, 16.
New to Iceland.

TRICHIA CONTORTA (Ditmar) Rost.
Material studied: Four moist chamber collections, three on bark of dead *S. phylicifolia* and one on litter of *P. glauca*.
Locality: 16, 17.
First reported by ROSTRUP (1903)

TRICHIA DECIPIENS (Pers.) Macbr. (Fig. 6).
Material studied: Eight field collections, one on rotten branch of *S. phylicifolia* on the ground and the rest on rotten wood or branches of *B. pubescens*.
Locality: 2, 4, 19, 21, 22.

Previously known from one locality, also in the south-western part of the country.

TRICHIA FAVOGINEA (Batsch) Pers. em. Farr
Material studied: One field collection on bark and wood of deciduous tree.
Locality: 20.
One earlier report from loc. 1 (GØTZSCHE 1984).

TRICHIA LUTESCENS (A. Lister) A. Lister
Material studied: Four field collections, three on branches of *B. pubescens* and one on bark of *S. phylicifolia*. Two moist chamber collections, both on bark of *B. pubescens*.
Locality: 3, 9, 12, 20, 21, 23.
New to Iceland.

TRICHIA MUNDA (A. Lister) Meylan (Fig. 3)
Material studied: Loc. 10, *HFG C570-4*, on twigs of *B. nana*. Loc. 12, *HFG C577-1*, on leaf litter of *B. pubescens*. Loc. 16, *HFG C533-1*, on leaf litter of *B. pubescens*; *HFG C540-1*, on litter of *L. russica*. Loc. 20, *HFG C668-1*, on litter of *Pinus* sp.; *HFG C669-1*, on litter of *P. glauca*.
New to Iceland.

Sporangia stalked, total height 0.3-1.4 mm, subglobose to pyriform, 0.2-0.5 mm in diam., varying from dull yellowish brown to dark purplish brown with yellow lines of dehiscence. Hypothallus inconspicuous, mostly circular, brownish. Stalk cylindric, longitudinally furrowed, 0.3-0.7 mm high, dark reddish brown to almost black, filled with refuse matter. Peridium membranous, pale yellowish in transmitted light, with a faint striate pattern, heavily impregnated with brownish refuse matter, less so along lines of dehiscence. Elaters 3-5 µm wide with 20-25 µm long, tapered ends, 3-5 prominent, smooth and mostly regular spiral bands, ochraceous in mass, pale yellow in transmitted light. Spores globose to subglobose, from 10.1-11.6-12.4 µm (*HFG C570-4*) to 13.9-15.0-16.0 µm (*HFG C668-1*) in diam., finely and densely spinulose, ochraceous yellow in mass, pale to medium yellow in transmitted light.

Two species of *Trichia* have small, dark brownish sporangia with yellow lines of dehiscense and smooth, shortly tapered elaters, viz. *T. munda* (A. Lister) Meylan and *T. flavicoma* (A. Lister) B. Ing. Authentic material of both species has been examined. A slide marked "*Trichia Botrytis* Pers. v. *flavicoma*. Type" (Highcliff, 26 XII 1894, on holly leaves, BM) contained four sporangia. The spores were 10.3-10.5-11.8 µm in diam., finely spinulose and bright yellow in transmitted light. Elaters 2.5-4 µm wide, with 3-5 prominent, somewhat irregular spiral bands and with 25-40 µm long pointed ends, occasionally with globose swellings, yellow like the spores. Although labelled as such, this is not the type of *T. flavicoma* (conf. ING 1967). The slide marked "*Trichia Botrytis* Pers. v. *munda*. Type collection" (Drift Way, Epping forest, AGP., EFL., 29 XI 1896, on hornbeam leaves, BM) contained but one sporangium.

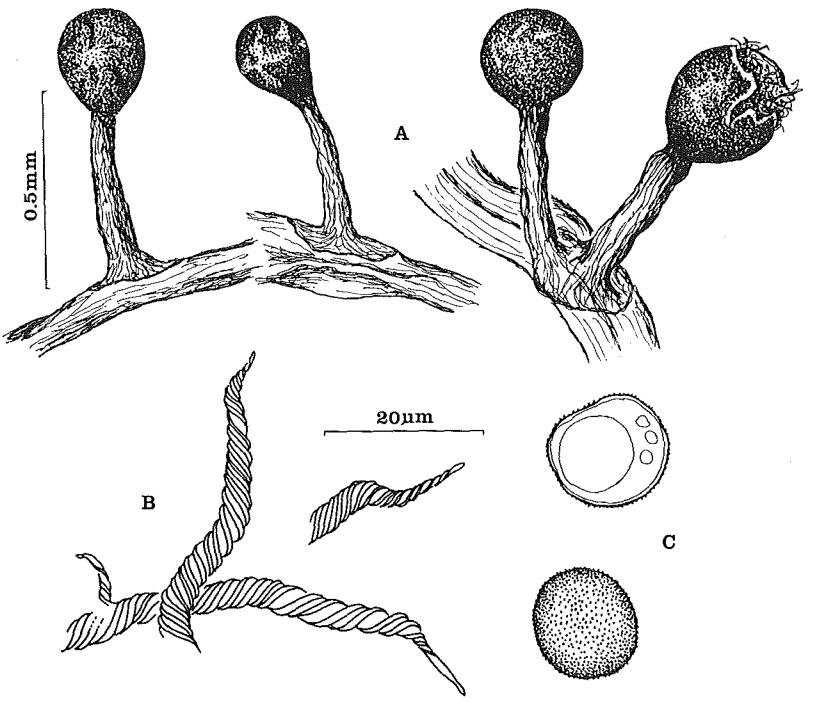

Fig. 3. *Trichia munda* (A. Lister) Meylan. A. Sporangia, *HFG C540-1*. B. Elaters, *HFG C533-1* and C. Spores, one of which is seen in optical section, *HFG C533-1*.

Spores were 11.3-12.5-13.4 µm in diam., finely spinulose and pale yellowish in transmitted light. Elaters 4-5 µm wide, with 4-5 low, smooth and regular spiral bands, 40-60 µm long pointed ends, pale yellowish, possibly faded.

These observations agree with the description of *T. flavicoma* by KOWALSKI (1974) based on the type from England and on American collections. ING (1967) as well as KOWALSKI (l.c.) stress the diagnostic value of the bright yellow spores and elaters. A detailed description of *T. munda* was given by NANNENGA-BREMEKAMP (1974) which, except for slightly smaller spores, concurs with my observations of the BM material.

In capillitial characters the Icelandic material seems mostly related to the BM collection of *T. flavicoma*, whereas in spore-size it is closer to the *T. munda* collection. In the latter character the Icelandic material shows quite a large variation, which, however, may be due to do unfavourable conditions in the moist chambers.

Information on the two species in the literature is somewhat conflicting. The one distinguishing character between *T. flavicoma* and *T. munda* agreed upon by most authors is bright yellow spores of the former versus ochraceous yellow spores of the latter species (see e.g. LISTER 1894, MEYLAN 1927, ING 1967 and KOWALSKI 1974). As this is a feature which is not likely to be influenced by adverse conditions in the moist chambers, it is also attributed greatest value in this study.

TRICHIA SUBFUSCA Rex
Material studied: One field collection on rotten branch of *B. pubescens*.
Locality: 23.
New to Iceland.

DISCUSSION

One of the most striking features of the Icelandic Myxomycete flora as it is presently known is perhaps not the selection of species found there, but the apparent absence or scarcity of some species. Bearing in mind that these organisms have only been investigated rather sporadically in Iceland, only approx. 350 specimens have been registered so far, it must be assumed that many species have escaped detection.

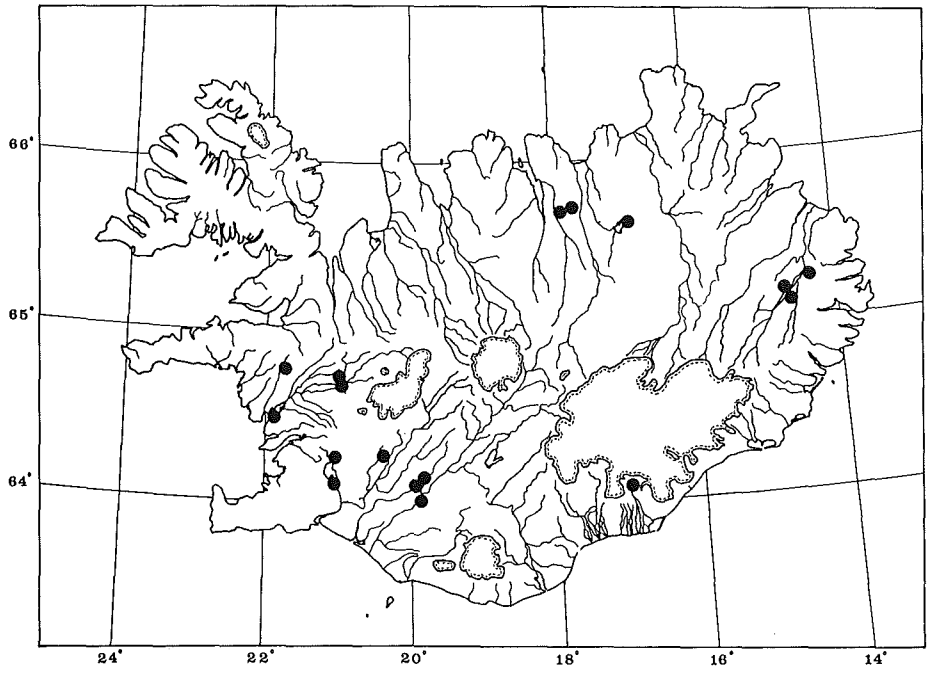

Fig. 4. Distribution in Iceland of *Arcyria incarnata* (Pers.) Pers. as it is known at present (based on field collections).

Several potential types of habitats have hardly been examined, f. ex. snowbeds, from which only a handful of collections have been made, grasslands from which less than 20 collections are known, and the several coniferous plantations of which only a few were visited during this study.

However, the obvious underrepresentation of species of, for instance, the Physarales is striking. Four species of *Physarum* (with six collections) are known from Iceland. HÄRKÖNEN (1979b) recorded six species of the genus from the three northernmost biological provinces in Finland, SCHINNER (1983) found 13 species of *Physarum* in the Abisko National Park in northern Sweden, and HJORTSTAM and JOHANNESEN (1980) reported nine *Physarum* species from the Dovrefjell National Park in central Norway. Although not entirely comparable to Iceland, these areas do share some climatic factors with that country as indicated by the common occurrence of the mountain birch. Species of *Fuligo* and *Didymium* have not been found in Iceland at all. Both genera are reported from all the three areas mentioned above. In the Trichiales, the absence of f.ex. *Arcyria obvelata* (Oeder) Onsberg and the apparent rarity of *Trichia contorta* and *T. varia* may be noted. *Stemonitopsis typhina* (Wiggers) Nann.-Brem. (Stemonitales) recorded from northern Finland and *Cribraria argillacea* (Pers.) Pers. (Liceales), reported as common in Abisko and also found in SW

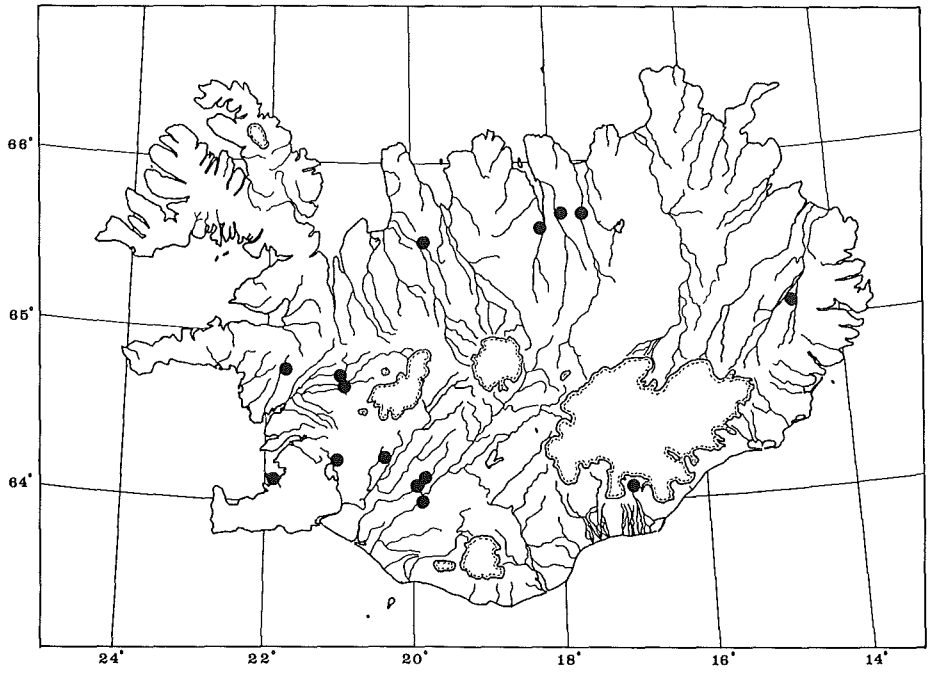

Fig. 5. Distribution in Iceland of *Echinostelium minutum* de Bary as presently known (based of moist chamber collections).

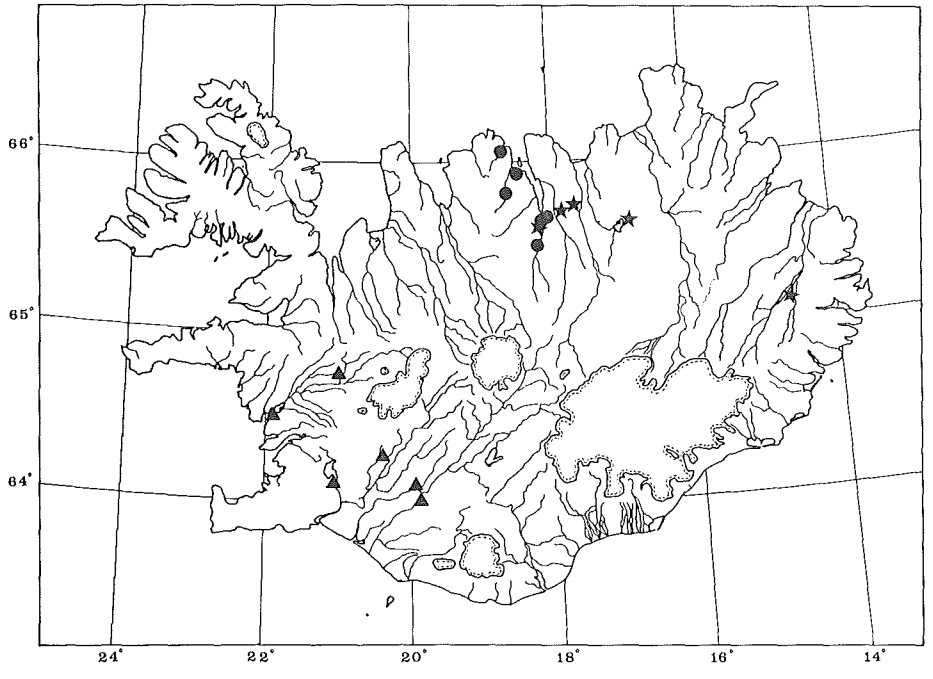

Fig. 6. Distribution in Iceland of *Badhamia macrocarpa* (Ces.) Rost. (solid circles), *Echinostelium corynophorum* (stars) and *Trichia decipiens* (Pers.) Macbr. (triangles).

Greenland (GØTZSCHE 1989) would likewise be expected in Iceland. All species mentioned are quite conspicuous due to size or mass fructifications, and are not likely to be overlooked in the field.

As to species cultured in moist chamber *Macbrideola cornea* (G. Lister & Cran) Alexopoulos and particularly *Paradiacheopsis fimbriata* (G. Lister & Cran) Hertel which was found in abundance in northern Scandinavia by HÄRKÖNEN (1978), are conspicuous by their absence.

The scarce material known from Iceland to this date does not permit any definite conclusions on specific distributional ranges. However, a few trends do emerge.

A number of species have been found at so many localities throughout the country that they can be assumed to be ubiquists. They are *Arcyria cinerea*, *A. incarnata* (fig. 4) *Comatricha nigra*, *Echinostelium brooksii*, *E. minutum* (fig. 5) and *Lycogala epidendrum*. These species all prefer a substrate of *B. pubescens*, either in the form of rotten wood and branches or as bark. *B. pubescens* is widely distributed in Iceland (see f.ex. HALLGRÍMSSON 1970) and the Myxomycetes mentioned are to be expected wherever the host species occur.

Badhamia macrocarpa (GØTZSCHE 1984), *E. corynophorum* and *Trichia decipiens* with six, five and six collections, respectively, seem at present to have a more restricted distribution in Iceland (fig. 6). *B. macrocarpa* is known only from the area around Eyjafjörður in North Iceland. All collections were made during the spring and early summer in connection with a study of low temperature fungi under snow cover (KRISTINSSON & GUÐLEIFSSON 1977). Taking into consideration the limited area of investigation and the time of fructification, this species has most probably been overlooked and is expected to be more widely distributed than indicated by the present finds.

Echinostelium corynophorum has been grown in moist chamber on bark from localities only in the North and East (fig. 6). Samples of similar material from all over the country have been cultured, so the limited distribution is not believed to be incidental. The localities of *E. corynophorum* are all situated in the most continental part of the country, but a correlation between distribution and climatic conditions needs yet to be proved.

On the contrary, the distribution of *Trichia decipiens* (fig. 6) as it is known at present, is limited to the most oceanic parts of Iceland. This is probably related to the fact that during the month of field work climatic condition for Myxomycetes were optimal only in that part of the country. Rather dry weather prevailed for some time in the north and east. Neither JOHANNESEN (1982) nor ING (1982) found any indication of a preference for oceanic conditions for this species.

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