

Mycological Investigations in Iceland - III

by

T.W. Johnson, Jr.
Department of Botany,
Duke University,
North Carolina, U.S.A.

The following report covers the period 25 August 1966 through 1 September 1966. It is an account of field studies and a statement on progress of study of the 1965 collections.

The chief purpose of the mycological studies in Iceland is a dual one, namely, a survey of aquatic fungi in Iceland (particularly on the south and southwest coastal plains, and an ecological study of aquatic fungi on Surtsey and its coastal waters. Emphasis in these investigations is on the freshwater and soil-inhabiting species.

During 1966, lignicolous species collected in 1965 were identified and histological sections prepared. Soil-inhabiting fungi (Chytridiomycetes and Comycetes) were recovered from samples collected in 1965. Only those fungi which grow on pollen, snakeskin and cellophane substrates were found. Over 450 soil samples were baited, with a yield of 46 per cent. The entire spectrum of fungi recovered has not been identified, but of those examined, the commonest representatives are in the following genera: Rhizophydium, Rhizophylctis, Phlyctochytrium, Chytridium, Podochytrium, Nowakowskiella, Pythium and Aphanomyces. At least four species of Rhizophydium are new to science, and it is likely that several undescribed variants of Pythium species are at hand. Among the fungi in genera of marine Ascomycetes, recovered from driftwood, are three species of Ceriosporopsis, five of Remispora and five of Corollospora. Lulworthia medusa is common. On the basis of several collections, revisionary studies are under way on two genera of didymosporous (2-celled spores) fungi. Further collections and histological studies are necessary before this phase may be completed.

Algal-inhabiting fungi are far less common than anticipated, although three species have been collected and identified. Most of the specimens thus far found have been immature or have consisted of discharged ascocarps or pycnidia only. One chytridiaceous fungus, Rozella marina has been collected; a paper describing this, the second known occurrence of the hyperparasite, has been published (MYCOLOGIA, 58: 490-494. 1966).

For the first time, in the collecting done during the period 25 August - 1 September, an attempt was made to gross culture aquatic fungi from soils and freshwater in Iceland and from "soil" on Surtsey. Two hundred seven samples of soil and water were baited immediately after collection. Although the total yield from these samples could not be determined (3-5 day growth period required), the following preliminary yields show a promising trend: number of samples yielded: 34; number of genera represented: 8; probable number of species: 11. Samples were baited only with hempseed (Cannabis sativa), hence only representatives of the Saprolegniaceae and Pythiaceae were collected, with one known exception. The general of biflagellate fungi represented (with the number of species positively identified) are:

Achlya (5)
Saprolegnia (6)
Pythium (4)
Thraustotheca (1)
Brevilegnia (1)

One of the Saprolegnias, S. ferax was infected by a holocarpic, monocentric, endobiotic parasite, a species of Olpidiopsis. Resting spores (oögonia) are absent, hence this lagenidiaceous fungus cannot be identified with certainty. Spherical sporangia ornamented with minute spines characterize the asexual phase of this Olpidiopsis.

The collection sites and the number of samples taken at each site follow:

- (1) Pasture soil, vicinity of Reykjavik; 9 samples. 8/25/66
- (2) Pasture soils, water from small pools and streams, between Sandgerdi and Hvalsnes; 19 samples. 8/26/66
- (3) Lava soils, vicinity of Krisuvik; 26 samples. 8/26/66
- (4) Soils and water from vicinity of Thorisstadvatn; 21 samples. 8/27/66
- (5) Farm and pasture soils, northwest of Fitjar, near Skorradalsvatn; 9 samples. 8/27/66
- (6) Soils from base of Ingolfsfjall; 9 samples. 8/28/66
- (7) Soils (predominantly lava) and water from depressions, pools and streams, along east side of Thingvallavatn; 13 samples. 8/28/66
- (8) Pasture soils, vicinity of Skalholt; 11 samples. 8/28/66
- (9) Water from lake and soils from edge of Kerid; 8 samples. 8/28/66
- (10) Agricultural soils in vicinity of Skeidflötur (south of Myrdalsjökull); 8 samples. 8/28/66
- (11) Soils from lava fields southeast of Innri-Njardvik; 12 samples. 8/29/66
- (12) Soils from vicinity of entrance to Holmsheidi; 12 samples. 8/29/66
- (13) Water from roadside pools and streams, northwest of Akranes; 10 samples. 8/30/66
- (14) Water from ditches, pools and streams at east end of Hvalfjörður; 20 samples. 8/31/66
- (15) Water from pools, ditches and streams in vicinity of Vatnaöldur; 20 samples. 9/1/66
- (16) Lava soils from Surtsey; 40 samples. 9/1/66

In addition to the foregoing collections, traps were placed in fresh and saltwater. Ten panels of pine and yellow poplar wood (Pinus taeda and Liriodendron tulipifera, respectively) were submerged at low tide, off Surtsey, on 1 September. On 30 August

two screen-wire traps containing apples were submerged in Raudavatn. The wood panels will be harvested in March, 1967; the apple traps were submerged in an attempt to collect representatives of the Blastocladales and Leptomitales which should occur in Icelandic waters but have not been so reported.

All of the fungi found are first records for Iceland since no prior work has been done on either the freshwater or marine fungi in this country. A lengthy checklist is being compiled; with this list reasonably well completed, we should have data applicable to possible sources of colonization, by aquatic fungi, of Surtsey.

Personnel, in addition to the principal investigator, include Dr. A.R. Cavaliere, Department of Biology, Gettysburg College, Gettysburg, Pennsylvania, and Mr. K.L. Howard, graduate student, Department of Botany, Duke University. Professor Cavaliere is engaged in revisionary studies of lignicolous marine Ascomycetes, and together with T.W. Johnson, is investigating alga-inhabiting marine fungi of Iceland. Mr. Howard's doctoral dissertation (in preparation) is on the taxonomy and occurrence of aquatic "Phycomycetes" in Iceland. It is expected that a second student will begin work in early 1967 on the Mucorales of Icelandic soils. This study should have particular application to the microbiology of Surtsey since mucoraceous fungi are not water-borne as are other "Phycomycetes". (U.S. Atomic Energy Commission, Contract AT-(40-1)-3556. Report No. ORO-3556-1).