

Mycological Investigations — V

By

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This report covers the period March, 1968, to December, 1968. During this time, twenty-eight days were spent in the field in Iceland, collecting soil and water samples and baiting them for aquatic fungi. The bulk of the results of the work in Iceland is embodied in the papers cited at the end of this report. The following paragraphs summarize our efforts, and present some general notes on the aquatic fungi of Iceland.

Most of the field work has centered in southwestern Iceland, on Heimaey, in the vicinity of Akureyri, and in the area around Egilsstaðir. We have not collected in northwestern or central Iceland, hence the mycoflora of these areas is unexplored. Very few samplings have been done on Surtsey for two reasons. First, the collections from Surtsey have not yielded aquatic fungi, as would be expected, and we anticipate the passage of several more years before such a flora will establish itself. Second, the aquatic mycoflora of the mainland is particularly rich and diverse, and therefore presents numerous mycological problems. Our efforts, therefore, have been with the mycological flora least known but most abundant.

The total aquatic mycoflora of Iceland, insofar as it is known, is not unique. We have collected and identified many species having a cosmopolitan distribution — species that can be found in soil and in freshwater habitats in almost all temperate and tropical areas of the world. Thus, we are not surprised to find such species as *Rhizophydium pollinis-pini*, *R. sphaerotheca*, *Saprolegnia ferax*, *Achlya americana*, *Aphanomyces laevis*, and a host of others in Iceland. Some segments of the mycoflora are, however, unexpected, and present unexplainable distributional patterns. *Brevilegnia*, for example, a genus

of plants long thought to be tropical or subtropical, is represented in Iceland. Two species of *Phlyctochytrium* known only from single collections in North Carolina are found commonly in lava soils in southwestern Iceland. There are numerous other examples cited in papers in the literature list.

Equally exciting mycologically is the unexpected frequency of fungi parasitic on other aquatic species. Several species of *Olpidiopsis* are at hand, and we have also collected parasitic species of *Rozella*, *Woronina*, *Rhizophydium*, and *Sorosphaera*. The diversity of the aquatic mycoflora is further illustrated by the generous abundance of species known only from single collections in Europe and North America. These also are cited in the papers in the literature list.

Of particular interest to the mycologist, however, is the abundance of forms and variants that do not fit species descriptions. These are troublesome fungi with which to work, and many have not yet been identified. They are of extreme importance, however, because they contribute to our knowledge of species variation. The ready availability of these variants constitutes the chief value of the Iceland aquatic mycoflora to mycology.

No checklist of the aquatic fungi of an area is ever complete. However, we can at this time report the occurrence of a sizeable number of species. The following listing is in striking contrast to the first report, by Larsen (in 1931), of eleven species in Iceland. Together with K. L. Howard, I am preparing a manual of the aquatic fungi of Iceland. The following species (and others certain to be found in future collections) will be described and illustrated. The manual will include notes on collecting and identifying these organisms.

PARTIAL LIST OF AQUATIC FUNGI

A

Achlyogeton entophytum
Apodachlya brachynema
A. pyrifer
Aphanomyces laevis
A. scaber
A. helicoides
Aphanomycopsis bacillariacearum
Ancylistes closterii
Achlya radiosa
A. treleaseana
A. intricata
A. diffusa
A. flagellata
A. conspicua
A. cambrica
A. americana
A. racemosa
A. spiracaulis

B

Blyttomyces helicus
Brevilegnia parthenospora n. sp.

C

Cladochytrium hyalinum
C. replicatum
Cylindrochytrium johnstonii
Chytridium polysiphoniae
C. versatile
C. olla
C. sphaerocarpum
C. lagenaria
Chytriomycetes spinosus
C. vallesiacus
C. mammilifer

D

Diplophlyctis intestina
D. sexualis
Dictyuchus monosporus

E

Entophlyctis confervae-glomeratae
Ectrogella perforans

H

Hyphochytrium catenoides

K

Karlingiomyces marilandicus
Karlingiomyces sp.

L

Leptomitus lacteus
Leptolegniella kerationphilum
Leptolegniella sp.
Lagenidium pythii
Lagenidium sp.

M

Micromyces zygogonii
Micromyces sp.

N

Nowakowskiella elegans
Nowakowskiella sp.

O

Olpidium longicollum
O. pendulum
O. rhizophlyctidis
O. endogenum
O. entophytum
Olpidiopsis saprolegniae
O. aphanomycis
O. andreii
O. feldmanii
O. cristata n. sp.
O. fibrillosa
O. saprolegniae var. *laevis*

P

Podochytrium clavatum
P. cornutum
Petersenia lobata
P. pollagaster
Pythiopsis cymosa
Pontisma lagenidioides
Phlyctidium brebissonii
P. brauni
P. olla
Phlyctidium sp.
Phlyctochytrium reinboldtae
P. icelandicum n. sp.
P. irregulare
P. punctatum
P. palustre
P. papillatum
P. bullatum
P. biporosum
P. equale
P. hallii
P. indicum
P. mucronatum
Pythium torulosum
P. rostratum
P. dissotocum

P. monospermum
P. debaryanum

R

Rhizophyidium halophilum
R. utriculare
R. horizontale
R. rostellatum
R. fragilariae
R. parasitans
R. pythii
R. pollinis-pini
R. sphaerotheca
R. globosum
Rozella marina
R. septigena
Rhizophlyctis petersenii
R. rosea
Rhizoclostridium globosum
Rhizidium varians

S

Septosperma rhizophydii
Solutoparies pythii
Sorosphaera duodenicystis n. sp.
Saprolegnia asterophora

S. hypogyna
S. torulosa
S. ferax
S. terrestris
S. diclina
S. uliginosa
S. glomerata
Sirolpidium bryopsidis

T

Thraustochytrium proliferum
T. globosum

Publications:

- Johnson, T. W., Jr. *Rozella marina* in *Chytridium polysiphoniae* from Icelandic waters. *Mycologia*, 1966.
- . Aquatic fungi of Iceland: introduction and preliminary account. *Jour. Elisha Mitchell Sci. Soc.*, 1968.
- and K. L. Howard. Aquatic fungi of Iceland: species associated with algae. *Jour. Elisha Mitchell Sci. Soc.*, 1968.
- . Aquatic fungi of Iceland: *Phlyctochytrium* Schroeter. *Arkiv für Mikrobiol.*, 1969.
- . Aquatic fungi of Iceland: *Olpidium* (Braun) Rabenhorst. *Arkiv für Mikrobiol.*, 1969.
- Howard, K. L. and T. W. Johnson, Jr. Aquatic fungi of Iceland: some filamentous, eucarpic, and holocarpic species. *Mycologia*, 1969.