

Some foliicolous fungi on grasses in North Iceland

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ABSTRACT: A number of fungi were identified from leaves of grasses collected in North Iceland in 1973-79 and from herbarium specimens collected in 1960-66. Nine species of the parasites and ten of the saprophytes reported are new records for the country. New host species are recorded for two parasites previously known from Iceland.

Leaf pathogens occurring on grasses in Iceland have not been the subject of specific surveys, although a number of fungi have been recorded from native and cultivated grasses (ROSTRUP 1903; LARSEN 1932; JÖRSTAD 1952, 1963; URBAN 1958; HAGEN 1959). In the humid climate of Iceland leaf fungi become rather apparent on grasses, especially in late summer and fall. This is the case with powdery mildew and rusts. Certain leaf spot fungi seem to be very widespread on some grasses, the genera *Alopecurus* and *Agrostis* appearing to be the most susceptible ones. It is quite obvious that these attacks can reduce both yield and quality of the grasses. This report deals with fungi identified from grass leaves collected in North Iceland during 1960-1979.

MATERIALS AND METHODS

In 1973-77 samples of grass species showing leaf-spot symptoms were collected during the growing season at different locations in North Iceland. Most samples were collected from cultivated fields, but some from noncultivated grasslands. All samples were air dried before storage. During the 1978 and 1979 seasons all these samples were examined microscopically and some were taken from the field and plated directly on sterile, moist filter paper in petri dishes. Samples of grasses that had been collected during 1960-66, and deposited in the herbarium of the Akureyri Museum of Natural History, were also examined. Most of the parasitic and saprophytic fungi on the dried grasses were identified by Dr. Kaiho Mäkelä, Institute of Plant Pathology, Agricultural Research Centre, Vanta, Finland. Rusts were identified by

Dr. Halvor B. Gjørum, Norwegian Plant Protection Institute, Ås-NLH, Norway. All samples are deposited in the herbarium of the Akureyri Museum of Natural History.

RESULTS

Parasitic and saprophytic fungi were identified on 45 of the 69 grass samples examined (Table 1). The fungi are listed here together with notes on previous records of the pathogens in Iceland. The location, at which each specimen was found, is indicated by the collection number (Table 1) in parenthesis.

A. Leaf-spot fungi.

TELIMENELLA GANGRAENA (Fr.) Petr.

Recorded from Iceland by LARSEN (1932) as *Phyllachora poae* on *Poa nemoralis*. Recorded by JÖRSTAD (1963) on *P. nemoralis* and *P. glauca*.

Found on *Alopecurus pratensis* (32) and *Festuca rubra* (29).

SELENOPHOMA DONACIS (Pass.) Sprague & A.G. Johnson

Previous record from Iceland by JÖRSTAD (1963) on *Deschampsia caespitosa*, *Hordeum vulgare*, and *Poa trivialis*.

Found on *Deschampsia caespitosa* (19). The spores (2) were 3.4 x 24.0 μm , aseptate; in size these specimens are closer to the main form of the fungus than to *S. donacis* var. *stomaticola*. The material from JÖRSTAD (1963) was placed under *S. donacis* var. *stomaticola*.

SEPTORIA NODORUM (Berk.) Berk. & Br.

New to Iceland.

Found on *Poa pratensis* (44).

SEPTOGLOEUM OXYSPORUM Bomm., Rouss & Sacc.

Recorded by LARSEN (1932) as *Phyllachora graminis* on *Agrostis tenuis*; *Cheilaria agrostidis* Lib. recorded by JÖRSTAD (1963) on *A. tenuis*.

Found on *Agrostis tenuis* (40, 55, 63). The conidia (3) were 6.7 x 29.0 μm , mostly 2-septate.

MASTIGOSPORIUM ALBUM Riess

Previous record from Iceland by LARSEN (1932) on *Agrostis tenuis* and *Hierochloë odorata*.

Found on *Alopecurus pratensis* (32). According to SPRAGUE (1950) and MÄKELÄ (1970), *M. album* should be restricted to the genus *Alopecurus*. The material from LARSEN (1932) could rather belong to *M. rubricosum*, which is common on the genus *Agrostis*,

but which has not been found on *H. odorata*.

MASTIGOSPORIUM DESCHAMPSIAE Jörstad

New to Iceland.

Found on *Deschampsia caespitosa* (42).

MASTIGOSPORIUM RUBRICOSUM (Dearn. & Barth.) Nannf.

New to Iceland.

Found on *Alopecurus pratensis* (30) and on *Phleum commutatum* (21). As noted above, the record of *M. album* by LARSEN (1932) may be *M. rubricosum*. According to MÄKELÄ (1970) *M. rubricosum* is found on *A. pratensis* and *Phleum pratense*, but has not been found on *Phleum commutatum*.

RHYNCHOSPORIUM ORTHOSPORUM Caldwell

New to Iceland.

Found on *Alopecurus pratensis* (11, 13, 30, 32, 57, 58, 62, 68), *Dactylis glomerata* (37, 51), and *Agrostis tenuis* (40). The conidia (4) were 3.6 x 16.5 µm and 1-septate.

SPERMOSPORA CILIATA (Sprague) Deighton

New to Iceland.

Found on *Festuca rubra* (47) and *Poa alpina* (49). According to MÄKELÄ (1972b) this fungus attacks a large number of hosts, among them *F. rubra* and *P. trivialis*, but it has not been found on *P. alpina*.

HELMINTHOSPORIUM VAGANS Drechs1.

New to Iceland.

Found on *Poa pratensis* (12, 16, 41, 43, 44, 54, 56, 64, 67, 69). Conidia (15) were 19.2 x 83.2 µm and mainly 7-septate.

HELMINTHOSPORIUM PHLEI (Graham) Scharif.

New to Iceland.

Found on *Phleum pratense* (52, 59).

HETEROSPORIUM PHLEI Gregory

New to Iceland.

Found on *Alopecurus pratensis* (30, 58, 62, 68), *Phleum pratense* (35, 59, 65), and *Deschampsia caespitosa* (39). According to SPRAGUE (1950) and O'ROURKE (1976) *Heterosporium phlei* is restricted to the genus *Phleum*. In spite of that MÄKELÄ (1972a) found *H. phlei* on many grasses including *Phleum pratense* and *Alopecurus pratensis*. On the other hand, SUNDHEIM & ÅRVOLD (1969) failed to infect other grass species with inoculum from *Phleum pratense*. This could depend on the host specificity of the fungus. Conidia (5) were 9.6 x 22.6 µm, 1-3-septate.

HADROTRICHUM VIRESCENS Sacc. et Roum.

Recorded by LARSEN (1932) as *Phyllachora graminis* (Pers.) Fuck. on *Agrostis tenuis* and *A. canina*. Recorded by JÖRSTAD (1963) as conidial stage of *Scirrhia agrostis* (Fuck.) Wint. on *A. stolonifera* and *A. tenuis*.

Found on *Agrostis tenuis* (40). Conidiophores (3) were 6.2 x 24.5 µm, septate, and the conidia were 13.8 µm in diameter.

B. Rusts.

Puccinia Festucae Plowr.

New to Iceland.

Identified (II and III) on *Festuca rubra* (7). JÖRSTAD (1951) mentions that *Uredo festucae* DC. could be identical with *Puccinia festucae*, but that without teliospores (III) it must be classified as *Uredo festucae* (GJÆRUM, 1974). In the present sample both uredial (II) and telial (III) stages were found.

Puccinia Poae-nemoralis Oth.

Previous records from Iceland by LARSEN (1932), JÖRSTAD (1951), and HAGEN (1958), on a wide range of hosts. Identified (II) on *Poa pratensis* (15, 17, 46, 60), *Anthoxanthum odoratum* (1) and *Trisetum spicatum* (50).

Uredo Festucae DC.

Previous record from Iceland by LARSEN (1932) on *Festuca rubra* and by JÖRSTAD (1951) on *F. rubra* and *F. vivipara*.

Identified on *Festuca rubra* (48).

C. Saprophytes.

Phaeosphaeria vagans (Niessl) O. Erikss. on *Festuca rubra* (47).

Phaeosphaeria microscopica (P.Karst.) O.Erikss. s.lat. on *Festuca rubra* (47).

Phaeosphaeria herpotrichoides (De Not.) I. Holm on *Dactylis glomerata* (37) and *Phleum pratense* (52).

Lophodermium arundinaceum (Schrad. ex Fr.) Chev. on *Festuca rubra* (7), *Elymus arenarius* (6) and *Calamagrostis neglecta* (3).

Darlucalium filum (Biv.-Bern. ex Fr.) Cast. on *Anthoxanthum odoratum* (1) and *Poa pratensis* (17).

Hendersonia crastophila Sacc. on *Poa pratensis* (44).

Hendersonia culmicola Sacc. on *Agrostis tenuis* (55).

Phaeoseptoria poae Sprague on *Alopecurus pratensis* (58) and *Poa pratensis* (44).

Ovularia pusilla (Ung.) Sacc. & D. Sacc. on *Deschampsia caespitosa* (45).

TRICELLULA AQUATICA Webster on *Agrostis tenuis* (40) and *Phleum pratense* (59).

VOLUCRISPORA GRAMINEA (Haskins) Ingold, McDonald & Dann. on *Phleum pratense* (59).

PERICONIA DIGITATA (Cooke) Sacc. on *Deschampsia caespitosa* (42).

Apart from *Lophodermium arundinaceum* and *Darlucua filum*, which both are reported by LARSEN (1932), these saprophytes are new records for Iceland.

D. Other fungi.

Fungi not determined to species included *Clathridium* spp., *Pyrenophora* spp., *Pleospora* spp., *Ascochyta* spp., *Stagonospora* spp., *Oidium* spp., *Cladosporium* spp., *Cercospora* spp., and *Fusarium* spp.

DISCUSSION

This investigation was not intended to be a complete study of the parasitic fungi of grasses in North Iceland. The samples were not taken systematically and most of the fungi were identified from dry plant materials. The fungi most frequently identified, therefore, are those that have produced spores that are preserved on dried leaves and are not necessarily those that are most common in the field. Nevertheless, the most common fungi on these samples were *Rhynchosporium orthosporum*, *Helminthosporium vagans*, *Heterosporium phlei* and *Puccinia poae-nemoralis*.

Some of the fungi mentioned in this article have been found before by LARSEN (1932) and JÖRSTAD (1951, 1963). The following parasites are new records for Iceland:

Septoria nodorum on *Poa pratensis*.

Mastigosporium deschampsiae on *Deschampsia caespitosa*.

Mastigosporium rubricosum on *Alopecurus pratensis* and *Phleum commutatum*.

Rhynchosporium orthosporum on *Alopecurus pratensis*, *Agrostis tenuis* and *Dactylis glomerata*.

Spermospora ciliata on *Festuca rubra* and *Poa alpina*.

Helminthosporium phlei on *Phleum pratense*.

Helminthosporium vagans on *Poa pratensis*

Heterosporium phlei on *Alopecurus pratensis* and *Phleum pratense*.

Puccinia festucae on *Festuca rubra*.

Some of the saprophytic fungi reported here are often regarded as parasites (SPRAGUE 1950, MÄKELÄ 1976, 1977), although none of them are strong or important pathogens. This is the case with *Hendersonia crastophila* on *Poa pratensis*, *H. culmicola* on *Agrostis tenuis*, and *Ovularia pusilla* on *Deschampsia caespitosa*, all of which are new to Iceland.

TABLE 1. Collection data for grass species affected by fungal pathogens and saprophytes.

No.	Date	Species	Location	District*)	Collector*)
1.	20.7.60	<i>Anthoxanthum odoratum</i>	Gróðrarstöðin	Eyjaf.	HHg
3.	2.7.60	<i>Calamagrostis neglecta</i>	Akureyri	Eyjaf.	HHg
6.	2.8.60	<i>Elymus arenarius</i>	Akureyri	Eyjaf.	HHg
7.	8.9.66	<i>Festuca rubra</i>	Myrkárdalsmynni	Eyjaf.	HHg
11.	8.7.75	<i>Alopecurus pratensis</i>	Galtalækur	Eyjaf.	BEG
12.	1.8.75	<i>Poa pratensis</i>	Sandfellshagi	N.-Þing	BEG
13.	15.9.75	<i>Alopecurus pratensis</i>	Lystigarðurinn	Eyjaf.	BEG&HKr
15.	15.9.75	<i>Poa pratensis</i>	Lystigarðurinn	Eyjaf.	BEG&HKr
16.	15.9.75	<i>Poa pratensis</i>	Lystigarðurinn	Eyjaf.	BEG&HKr
17.	15.9.75	<i>Poa pratensis</i>	Lystigarðurinn	Eyjaf.	BEG&HKr
19.	15.9.75	<i>Deschampsia caespitosa</i>	Lystigarðurinn	Eyjaf.	BEG&HKr
21.	15.9.75	<i>Phleum commutatum</i>	Lystigarðurinn	Eyjaf.	BEG&HKr
29.	15.9.75	<i>Festuca rubra</i>	Lystigarðurinn	Eyjaf.	BEG&HKr
30.	25.6.76	<i>Alopecurus pratensis</i>	Hólar	Skag.	BEG
32.	1.7.76	<i>Alopecurus pratensis</i>	Gróðrarstöðin	Skag.	BEG
35.	18.7.76	<i>Phleum pratense</i>	Gróðrarstöðin	Skag.	BEG
37.	18.7.76	<i>Dactylis glomerata</i>	Gróðrarstöðin	Skag.	BEG
39.	23.7.76	<i>Deschampsia caespitosa</i>	Langhús	Skag.	BEG
40.	23.7.76	<i>Agrostis tenuis</i>	Bergland	Skag.	BEG
41.	23.7.76	<i>Poa pratensis</i>	Búrfell	V.-Hún.	BEG
42.	23.7.76	<i>Deschampsia caespitosa</i>	Bergland	Skag.	BEG
43.	24.7.76	<i>Poa pratensis</i>	Birkihlíð	Skag.	BEG
44.	25.7.76	<i>Poa pratensis</i>	Hólar	Skag.	BEG
45.	11.5.76	<i>Deschampsia caespitosa</i>	Möðruvellir	Eyjaf.	BEG
46.	11.9.76	<i>Poa pratensis</i>	Hólasandur	S.-Þing.	BEG
47.	11.9.76	<i>Festuca rubra</i>	Hólasandur	S.-Þing.	BEG
48.	12.9.76	<i>Festuca rubra</i>	Öxarfjarðarheiði	N.-Þing.	BEG
49.	12.9.76	<i>Poa alpina</i>	Öxarfjarðarheiði	N.-Þing.	BEG
50.	12.9.76	<i>Trisetum spicatum</i>	Öxarfjarðarheiði	N.-Þing.	BEG
51.	15.9.76	<i>Dactylis glomerata</i>	Lystigarðurinn	Eyjaf.	BEG
52.	20.7.77	<i>Phleum pratense</i>	Sandfellshagi	N.-Þing.	BEG
54.	20.7.77	<i>Poa pratensis</i>	Sandfellshagi	N.-Þing.	BEG
55.	22.7.77	<i>Agrostis tenuis</i>	Bessastaðir	V.-Hún.	BEG
56.	22.7.77	<i>Poa pratensis</i>	Bessastaðir	V.-Hún.	BEG
57.	23.7.77	<i>Alopecurus pratensis</i>	Búrfell	V.-Hún.	BEG
58.	24.7.77	<i>Alopecurus pratensis</i>	Hólar	Skag.	BEG
59.	24.7.77	<i>Phleum pratense</i>	Hólar	Skag.	BEG
60.	24.7.77	<i>Poa pratensis</i>	Langamýri	Skag.	BEG
62.	24.7.77	<i>Alopecurus pratensis</i>	Langamýri	Skag.	BEG
63.	24.7.77	<i>Agrostis tenuis</i>	Hólar	Skag.	BEG
64.	28.5.78	<i>Poa pratensis</i>	Gróðrarstöðin	Eyjaf.	BEG
65.	27.7.78	<i>Phleum pratense</i>	Gróðrarstöðin	Eyjaf.	BEG
67.	27.7.79	<i>Poa pratensis</i>	Möðruvellir	Eyjaf.	BEG
68.	27.7.79	<i>Alopecurus pratensis</i>	Möðruvellir	Eyjaf.	BEG
69.	27.7.79	<i>Poa pratensis</i>	Möðruvellir	Eyjaf.	BEG

*) Abbreviations: Eyjaf.: Eyjafjarðarsýsla. N.-Þing.: Norður-Þingeyjar-sýsla. Skag.: Skagafjarðarsýsla. V.-Hún.: Vestur-Húnavatnssýsla. S.-Þing.: Suður-Þingeyjarsýsla. HHg: Helgi Hallgrímsson. BEG: Bjarni E. Guðleifsson. HKr: Hörður Kristinsson.

Telimenella gangraena was found on *Alopecurus pratensis* and *Festuca rubra*; LARSEN (1932) and JÖRSTAD (1963) reported this fungus on *Poa glauca* and *Poa nemoralis*.

Mastigosporium album was reported by LARSEN (1962) on *Agrostis tenuis* and *Hierochloë odorata*. However if the fungus should belong to *M. rubricosum*, the specimen of *M. album* reported here on *Alopecurus pratensis* is also a new record for Iceland.

The collections of *Selenophoma donacis* on *Dactylis glomerata* seem to belong to the main form (*S. donacis* var. *donacis*) rather than to *S. donacis* var. *stomaticola* as reported by JÖRSTAD (1963).

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