On fungi collected on Surtsey kept in the fungarium of the Natural Science Institute of Iceland, AMNH

GUÐRÍÐUR GYÐA EYJÓLFSDÓTTIR[1] AND MACIEJ LIPIŃSKI[2]

[1]Natural Science Institute of Iceland in Akureyri, Borgum at Norðurslóð, IS-600 Akureyri, Iceland (gudridur.g.eyjolfsdottir@natt.is)
[2]Student Scientific Club "SKN Medyków Roślin Armillaria", Department of Plant Protection, Division of Plant Pathology and Mycology, Wrocław University of Environmental and Life Sciences, 25 Norwida St., 50-375 Wrocław, Poland (124123@student.upwr.edu.pl)

ABSTRACT

In the fungarium of the Natural Science Institute of Iceland in Akureyri, AMNH, are samples of many of the fungi collected on Surtsey. Some have been identified to species while other only to the genus level. The first author had collected macrofungi and overwintered plant parts with microfungi. Macrofungi collected in 2008 have been reported but those from 2010 were introduced in a lecture in 2013 but not in print until now. This summer the second author examined microfungi on the dried plant material from 2008 and the results are presented here. Eleven species of microfungi new to Surtsey and two reported earlier were identified. A list of fungi on goose dung from Surtsey in 2008 where all eight species were new records for the island is included. Those results were part of a larger study of coprophilous fungi of Iceland. The macrofungi reported here new to Surtsey are seven plus one myxomycete identified. Four additional unidentified species of three genera are also new to the island.

INTRODUCTION

In the first investigation on macrofungi on Surtsey in early July 2008 no agarics were found but overwintered plant material and plant-parasitic microfungi on their host and microfungi on driftwood were collected. In August 2008, during the second investigation, sporocarps of ectomycorrhizal fungi of the three *Salix* L. species growing on the island were collected. Other fungi and fungal-like organisms were also collected and the species found were presented (Eyjólfsdóttir 2009) listing six agaric species that were identifed and two additional species which were identified to the genus level growing with *Salix* spp. plants.

Four of the agaric species listed in Eyjólfsdóttir (2009) were *Hebeloma* P. Kumm. species, of which *H. vaccinum* Romagn. and *H. velatum* (Peck) Peck (first identified as *H. collariatum* Bruchet) are very rare in Iceland. While the saprophytic *Entoloma sericeum* Quél. was present in large areas of the older part of the gull colony, in the forb rich grassland vegetation type (Magnússon *et al.* 2022). Hence, the species was well established in that habitat, where it was first observed in 2005 (Baldursson & Ingadóttir 2007) now its sporocarps were in long lines and rings indicating the growing edge of its mycelia in the grassland.

In sparse vegetation at the edge of the gull colony a small agaric identified as *Arrhenia rustica* (Fr.) Redhead, Lutzoni, Moncalvo & Vilgalys *s.l.* has been growing from around 1990, when it was first collected. Later its occurrence has moved with the edge of the expanding gull colony, in primarily the *Cochlearia* sea-cliff vegetation (Magnússon *et al.* 2022).

The third saprophytic agaric, *Deconica subviscida* Peck (first identified as *Psilocybe inquilinus* (Fr.) Bres.), produced its sporocarps among dead parts of the grass *Leymus arenarius* L. where it grew in

a sheltered area that retained moisture longer than the typical sandy soil of the island. In 2007 there had been 26 species of fungi and fungal-like organisms reported from Surtsey (Eyjólfsdóttir 2009) and in 2009 their number had increased to 33 (species identified to the genus level not included).

In 2008 three samples of goose dung were collected in July and two in August. Those samples were sent to Mike Richardson who incubated the goose dung in moist chambers and identified the fungi which fruited on the dung. Total of 8 species which all were new records for Surtsey, seven ascomycetes and one basidiomycete, and the findings were published by Richardson (2011) (Table 1).

Some fungi which have been found on Surtsey by other researchers and sent to the Natural Science Institute of Iceland are kept in the fungarium (AMNH). There is a table listing those seven received before 2008 in Eyjólfsdóttir (2009) with AMNH as reference.

In the culture collection of CBS of fungi and yeasts (Westerdijk Fungal Biodiversity Institute, Utrecht, The Netherlands) is an isolate of the fungus *Talaromyces aerugineus* (Samson) Yilmaz, Frisvad & Samson from soil on Surtsey deposited by A. Sponring in 1996, CBS 176.97. This species is presumed to be from Klamer *et al.* (2000) research on microbial biomass and community composition in soils collected near a crevice between the craters Surtur and Surtungur in 1996. They reported the number of colony forming units, CFU, from four samples from bare soil, one from soil covered by moss and six from area with *Honkenya peploides* (L.) Ehrh. This fungus could be from the sample from warm soil with moss with the highest CFU number.

The third investigation of macrofungi on Surtsey took place on 18-20 of August 2010, when all the 10 *Salix* spp. plants known at the time were checked for sporocarps of ectomycorrhizal fungi. Sporocarps of other fungi were also collected on the island. The macrofungi collected on Surtsey during this investigation and are kept in the fungarium (AMNH) are the main subjects of this article.

The results of the investigations on macrofungi 2008 and 2010 were presented at the Surtsey 50th anniversary Conference (Eyjólfsdóttir 2013). Then the fungi that had been reported on Surtsey from 1965 to 2013 were 51 including 1 basidiolichen and three fungus-like organisms. The updated results on species of fungi and fungal-like organisms that are presented in this article were first presented as a list of species, habitat or substrate and the year of sampling at a seminar in 2025 (Eyjólfsdóttir & Lipiński 2025).

Recently, Almeida *et al.* (2022) published their results from a sequence-based identification of soil samples taken from 23 permanent study plots on Surtsey in 2014. They reported 18 new genera and 56 new species for Surtsey, not listed in the Eyjólfsdóttir (2009) survey. They, however, noted that such sequence-based methods on soil samples may also pick up species which stem from wind-borne spores that have accumulated in the soil, forming a dormant propagule bank, but would not be truly established. For this reason, we choose to focus on those species which were identified based on their sporophores collected on Surtsey or cultivated in the laboratory from material from Surtsey. In the checklist of Icelandic fungi and fungal-like organisms (Hallgrímsson & Eyjólfsdóttir in preparation) the species Almeida *et al.* (2022) listed are included and all fungi from Surtsey have Surtsey specified in the distribution of the species.

Table 1. Coprophilous fungi on goose dung collected on Surtsey in 2008, a species list extracted from Richardson (2011).

Specimen no. in the article Surtsey grid system Species Collected on	26/08 D16 8 Jul	27/08 D16 8 Jul	28/08 B16 8 Jul	29/08 P11 11 Au	30/08 O11 13 Au
Ascobolus crenulatus P. Karst.	x				
Ascobolus stictoideus Speg.	x	x	x	x	x
Laetisaria fuciformis (Berk.) Burds.					x
Stemphylium vesicarium (Wallr.) E.G. Simmons				x	
Schizothecium vesticola (Berk. & Broome) N. Lundq.	x			x	
Sordaria fimicola (Roberge ex Desm.) Ces. & De Not.	x				
Sordaria minima Sacc. & Speg.		x			
Thelebolus stercoreus Tode	x	x	x	x	

METHODS

In 2008 fungi were collected in situ on Surtsey on July 7 to 10 and August 11 to 14. In 2010 fungi were collected August 19 to 20. Earlier that summer the known *Salix* sp. plants had been labelled with wooden pegs painted yellow and red and given numbers by a member of the biological expedition. *Salix herbacea L.,* two plants (no. 2; 11) were first found in 1995 estimated as two years old and additional two young plants (no. 5; 6) were present in 2010, increasing the total number of *S. herbacea* to four in 2010. *Salix phylicifolia* L. was first found in 1998, one plant (no. 1), but in 2010 there were in total three known plants (no. 7; 8). *Salix lanata* L. was first found in 1999 as one plant and in 2010 there were three *S. lanata* plants labelled (no. 3; 4; 9) (the first plant was then presumed dead).

The same methods as described in Eyjólfsdóttir (2009) were used in 2010 collecting, photographing, describing and drying the fungi and recording coordinates for each site and placing those in the 100 x 100 m grid system for Surtsey (Fig. 1).

In 2025 dried plant material collected on Surtsey in 2008 was examined by Maciej Lipiński and some of the microfungi identified. Those are reported in this article.

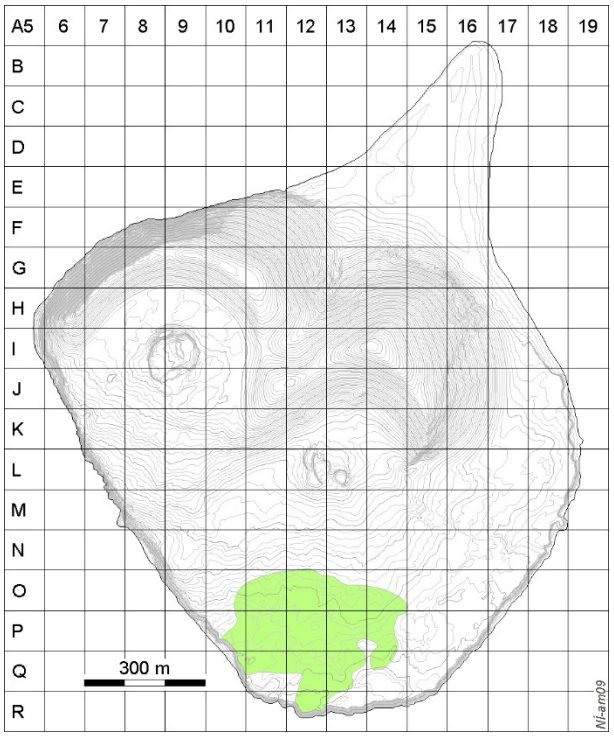

Figure 1. Surtsey in 2007 with the area of dense vegetation shown in green and the 100 x 100 m grid system for mapping distribution of plants and fungi on Surtsey. The names of quadrats of the grid e.g. (I8) or (O14), are used in the text to indicate the site where the fungus was collected.

Figure 2. The uredinia of *Puccinia festucae* infecting living leaves of *Festuca richardsonii* which show yellow bands where yellowish brown uredinia form. Surtsey, 9.07.2008 (Photo: GGE).

Figure 3. The growth of *Blumeria graminis*, a powdery mildew on living leaves of *Poa pratensis* on Surtsey on 11.08.2008 (Photo: GGE).

Dried plant material was examined using a dissecting microscope to locate fungi. Small slices of the plant tissue with what could be fungi were cut and placed on a microscope slide in a drop of water, allowed to soak, arranged on the slide and examined using a light microscope. If the fungus could be identified its name and plant host were listed and usually some spores were photographed through the lens of the microscope. Some of the samples did not include any useful fungal material for identification purposed.

RESULTS AND DISCUSSION

From the dried plant material collected in 2008 one rust fungus and one powdery mildew, both parasitic fungi of grasses, were identified. It was *Puccinia festucae* Plowr. urediniospores II, in a living *Festuca richardsonii* Hook. within yellow bands in the leaves with yellowish brown uredinia (P14 on Fig. 1) (Fig. 2) and *Blumeria graminis* (DC.) Speer, a powdery mildew making the surface of living leaves of *Poa pratensis* L. white where mycelium and chains of conidia cover their surface (O13) (Fig. 3).

Two fungal-like organisms, oomycetes, were found. The former on recently dead shoots of *Stellaria media* (L.) Vill. and the other on still living but yellow shoots of a *Honckenya peploides* plant, making the surface of the infected area appear mealy. These were identified as *Peronospora alsinearum* Casp. on dead shoots of *Stellaria media* (P14) (Fig. 4) and *Peronospora honckenyae* (Syd.) Syd. parasitic on a living *Honckenya peploides* plant (C16) turning its leaves yellow and mealy (Fig. 5).

Ascomycetes either their sexual state or anamorphic state were identified on overwintered plant parts. The species found included the ascomycetes *Alternaria alternata* (Fr.) Keissl., *Lophodermium alpinum* (Rehm) Weese in (N16) (Fig. 6) and in (L17) *Leptosphaeria elymi* P. Larsen found on overwintered leaves or other parts of the grass *Leymus arenarius*. Further, *Cladosporium cladosporioides* (Fresen.) G.A. de Vries and *Cladosporium macrocarpum* Preuss grew on dead shoots of *Honckenya peploides* (I18) (Fig. 7). The latter had previously been found in soil on Surtsey. *Pleospora junci* Pass. & Beltrani that was found on overwintered parts of *Juncus arcticus* Willd. in sandy soil (N15), *Pleospora eleocharidis* P. Karst. was found on overwintered *Poa pratensis* in the oldest part of the gull colony (P12) (Fig. 8) and *Stemphylium botryosum* Wallr. on dead leaves of *Cochlearia islandica* Pobed. in sparse vegetation on smooth lava, *Cochlearia* sea-cliff vegetation (O14) (Fig. 9).

Species found in other dead organic habitats included *Corniculantispora psalliotae* (Treschew) Khons., Thanakitp. & Luangsa-ard growing on a mouldy sporocarp of *Deconica subviscida* Peck amongst a *Penicillium* sp. (M16-M17) (Fig. 10). This finding in 2010 was the third occurrence of this fungcolous species on Surtsey. *Ceriporia reticulata* (Hoffm.) Domański is a basidiomycete found growing on decaying driftwood (D15), forming soft,

Figure 5. A *Honckenya peploides* plant with yellow shoots infected by *Peronospora honckenyae* while green shoots are next to them. Surtsey, 8.07.2008 (Photo:GGE).

Figure 4. Dead shoots of *Stellaria media* and a few still living on Surtsey on 9.07.2008. The plant parasitic *Peronospora alsinearum* was present on the dead leaves (Photo: GGE).

Figure 6. In overwintered parts of this *Leymus arenarius* plant, two microfungi, *Alternaria alternata* and *Lophodermium alpinum* had formed their spores. Surtsey, 9.07.2008 (Photo: GGE).

Figure 7. In recently dead shoots of *Honckenya peploides* the fungi *Cladosporium cladosporioides* and *C. macrocarpon* produced their conidiophores. Surtsey, 9.07.2008 (Photo: GGE).

Figure 8. In overwintered parts of this *Poa pratensis* the ascomycete *Pleospora eleocharidis* was found on Surtsey, 9.07.2008 (Photo: GGE).

Figure 9. *Cochlearia islandica* plant where spores of *Stemphylium botryosum* were found on dead parts on Surtsey, 9.07.2008 (Photo: GGE).

Figure 10. Three fungi, the agaric *Deconica subviscida* which is covered in growth of an unidentified *Penicillium* sp. but the third species, *Corniculantispora psalliotae,* grew mixed with the *Penicillium* sp. and was found when its conidia were seen during examination of the specimen with a microscope. Surtsey, 19.08.2010 (Photo: GGE).

white, reticulate sporocarps in gaps inside the wood (Fig. 11). This was its first occurrence on Surtsey in 2008.

The fungal-like organism *Didymium spongiosum* (Leyss.) J.M. García-Martín, J.C. Zamora & Ladó, a myxomycete previously known as *Mucilago crustacea* P. Micheli ex F.H. Wigg., was present in four places in the lush grass in the oldest part of the gull colony (P12) in 2010 (Fig. 12).

One myxomycete (Fig. 12) and six saprophytic basidiomycetes were collected on Surtsey for the first time and two saprophytic basidiomycetes additional two ectomycorrhizal species of *Cortinarius* were indentified to the genus level in 2010 (Eyjólfsdóttir 2013). Thus adding ten agaric species (thereof four only identified to a genus) to the known funga of Surtsey (Table 3).

Figure 11. White sporocarps of *Ceriporia reticulata* on decaying driftwood on Surtsey. 8.07.2008 (Photo: GGE).

Figure 12. The myxomycete *Didymium spongiosum* having crawled up the grass before turning into a sporocarp which resembles bird droppings. Surtsey. 20.08.2010 (Photo: GGE).

The ten species of agarics treated below were found for the first time on Surtsey in 2010, thereof six were identified to species and four only to the genus level. The first two in the lush grass of the oldest part of the gull colony (P11), which both are presumed to be nitrophilous fungi growing in fertile soils (Gerhardt 2012). *Panaeolus fimicola* (Pers.) Quél. its sporocarps bigger and darker than those of *Panaeolus olivaceus* F.H. Møller growing in the same spot (Fig.13). The *Panaeolus* sp. collected in 1994 by Hörður Kristinsson in a *Puccinella* grassland (P12) in the gull colony also fits the description of *P. fimicola*.

Figure 13. *Panaeolus fimicola* and *P. olivaceus* growing together in the grassland on the fertile soil of the oldest part of the gull colony in Surtsey. 20.08.2010 (Photo: GGE).

At the edge of the oldest part of the gull colony on a lava ridge (P13) a tall, 20 cm tall and with 14 cm wide cap, a whitish mushroom grew in grass, *Agaricus arvensis* Schaeff., three sporocarps were found in 2010 (Fig. 14). The sporocarps have been found repeatedly since, and in July 2025, nine groups of *A. arvensins* were recorded inside a 37 x 15 m (555 m^2) area where *A. arvensis* was originally found in 2010. In total the groups contained 43 sporocarps (B.D. Sigurdsson, pers. comm.). Assuming that all are linked to the same hyphal network and the distance between sporocarp groups are representing its area, the average increase is size has coarsely been 37 m^2 per year, since 2010.

Just outside the oldest part of the gull colony (P13) in less dense grass where the vegetation resembles that of the heathland type, three agarics were found growing: *Hygrocybe conica* (Schaeff.) P. Kumm. (Fig. 15), *Entoloma sericellum* (Fr.) P. Kumm. (Fig. 16) and the third that has finally been identified as a *Gamundia* Raithelh. species based on its verruculose spores, probably *Gamundia xerophila* (Luthi & Röllin) Raithelh. ex P.A. Moreau & Courtec. (Fig. 17).

In 2010 there were ten known *Salix* spp. plants on Surtsey and only one of them had not produced any sporocarps present at the time of the investigations in August of 2008 or 2010 (Table 2).

Figure 14. *Agaricus arvensis* growing in a lush grassland on Surtsey. Two mature sporocarps and one younger with the partial veil in the process of becoming a ring. 19.08.2010 (Photo: GGE).

Figure 15. *Hygrocybe conica*, three sporocarps, blackening at the base of stipe. Surtsey, 19.08.2010 (Photo: GGE).

Figure 16. *Entoloma sericellum*, its gills becoming pinkish as the spores mature. Surtsey, 19.08.2010 (Photo: GGE).

Figure 17. *Gamundia xerophila*, two photographs of its single slender sporocarp on Surtsey. 19.08.2010 (Photo: GGE).

Figure 18. Small reddish brown sporocarps of *Cortinarius* sp. with squamulose cap, which could belong in the *C. comatus* complex, close to *C. sagarum*. Growing with *Salix herbacea* no. 5 in Table 2. Surtsey. 19.08.2010 (Photo: GGE).

While less production of sporocarps was observed in 2010 around some of the older *Salix* sp. plants than in August 2008, two young *S. herbacea* L. where no sporocarps had been seen in 2008 now each had one agaric species producing its sporocarp(s) within the plant. Furthermore, a *Salix lanata* plant which had not been found in 2008 now had one unidentified *Cortinarius* sp. amongst its short shoots in the lush grassland of the oldest part of the gull colony.

In 2010 two unidentified *Cortinarius* species were found, one at young *Salix herbacea* no. 5 (O14) where no fungi had been found in 2008, and the other at *Salix lanata* no. 9 (O12) a plant that had not been found in 2008 as the grass probably covered it (Table 2). The former (Fig. 18) resembles species in the *Cortinarius comatus* complex, having squamulose cap and small reddish brown sporocarps, close to *C. sagarum* Kokkonen (Kokkonen 2020). The latter *Cortinarius* species had pale reddish brown cap with pointed umbo and very pale brown stipe (Fig. 19) and might be the species *C. fulvescens* Fr. which Almeida *et al.* (2022) found in soil from this area using ITS2 metabarcode sequensing of fungi.

Bjarni Diðrik Sigurðsson found the large

Table 2. Fungi present in 2008 and 2010 around the 10 individual *Salix* plants on Surtsey in 2010. Grid points refer to Fig. 1.

***Salix* species**	**No.**	**Grid plot**	**Ectomycorrhizal fungi 2010**	**Ectomycorrhizal fungi 2008**
Salix herbacea	2	I8	*Hebeloma mesophaeum*	*Hebeloma mesophaeum*
Salix herbacea	11	O12	*Entoloma sp*. (beige cap)	*Entoloma* sp (beige cap), *Hebeloma velatum,* *Laccaria laccata,* *Cortinarius* sp. (*Telamonia* dark brown cap)
Salix herbacea	5	O14	*Cortinarius* sp. (*Telamonia* reddish brown squamulose cap)	No fungi
Salix herbacea	6	O13	*Hebeloma* sp. (young)	No fungi
Salix phylicifolia	1	I9	*Hebeloma mesophaeum* (young)	*Hebeloma marginatulum*
Salix phylicifolia	7	O13	*Inocybe lacera*	*Inocybe lacera,* *Hebeloma vaccinum*
Salix phylicifolia	8	O13	*Hebeloma mesophaeum*	*Hebeloma mesophaeum*
Salix lanata	3	N14	No fungi	No fungi
Salix lanata	4	O14	*Hebeloma mesophaeum*	*Hebeloma mesophaeum*
Salix lanata	9	O12	*Cortinarius* sp. (reddish brown, conical cap)	Plant not found 2008

Figure 19. *Cortinarius* sp. growing with *Salix lanata* number 9 in rich grassland in the oldest part of the gull colony on Surtsey. Surtsey. 20.08.2010 (Photo: GGE).

Figure 21 Unidentified grayish brown *Arrhenia* sp. in a depression in the lava at the edge of the gull colony on Surtsey. 19.08.2010 (Photo: GGE).

sporocarps of *Neolentinus lepideus* (Fr.) Redhead & Ginns on driftwood in 2012 (Fig. 20).

There are agarics which have only been identified to the genus level in the fungarium. One of those is a grayish brown *Arrhenia* species (Fig. 21) collected amongst lichenes, in moss and sparse grass sheltered in a depression in the lava at the edge of the gull colony (O14) in 2010. Another is a rather small *Galerina* species in a strong reddish-brown colour (Fig. 22) growing in moss in a depression in the crater Surtungur (I8). Young and small sporocarps of a *Galerina* sp. were found amongst low moss and lichens in two places (O14). These may or may not be the same species.

Figure 20. Sporocarp of *Neolentinus lepideus* on driftwood. Surtsey. 16.07.2012 (Photo: Bjarni Diðrik Sigurðsson).

Figure 22. *Galerina* sp. on moss carpet in the sheltered Surtungur crater on Surtsey. 20.08.2010 (Photo: GGE).

The only *Galerina* species on Surtsey which has been identified was collected in 2015 by Bjarni Diðrik Sigurðsson, growing on wet dead leaves of *Leymus arenarius* (Fig. 23). It was much larger than the sporocarps from the crater (Fig. 22) and was identified as *Galerina pseudomycenopsis* Pilát. It grows in the same habitat as *Deconica subviscida* and both species are brown but *G. pseudomycenopsis* has longer spores. In 2010 *D. subviscida* was found in three sites, thereof two new sites (M16/M17, M17,

Figure 23. *Galerina pseudomycenopsis* on dead parts of *Leymus arenarius*. 17.07.2015 (Photo: Bjarni Diðrik Sigurðsson).

M18).

Further, some *Entoloma* specimens kept in the AMNH fungarium, other than those of *E. sericeum* and *E. sericellum*, have not been identified to the species level yet. Based on the different habitats where those specimens were collected they could belong to different species.

In the future, more focused collection of overwintered plant material would allow recording of more of the saprophytic microfungi of different plants on Surtsey. We identified one rust species, one powdery mildew and two *Peronospora* spp. on living plants or plants which had died the summer the material was collected. There are probably more plant parasitic fungi on the island.

In summary, the preliminary results from the 2008 and 2010 investigations were first presented at the Surtsey 50th Anniversary Conference (Eyjólfsdóttir 2013), then the fungi known from Surtsey were 51 including 1 basidiolichen and three fungus-like

Table 3. A list of fungi and fungal-like organisms collected on Surtsey or isolated from soil samples or other material from the island 1965 to 2024. Species in AMNH fungarium are marked (x).The year collected refers to when samples were collected with reference to the results. A question mark in the gridplot column for marine fungi refers to the beach of the island but to an old *Leymus arenarius* dune for the Glomeromycota.

Species of fungi or fungal-like organisms[j]	Year collected	Gridplot	Habitat or substrate	AMNH
Fungi Ascomycota				
*Alternaria alternata (*Fr.) Keissl.	2008 [a]	N16	*Leymus arenarius*, overwintered	x
Alternaria botrytis (Preuss) Woudenb. & Crous	1972 [d]	B15	From 14°C sand near driftwood	
Ascobolus crenulatus P. Karst.	2008 [h]	D16	Goose dung	x
Ascobolus stictoideus Speg.	2008 [h]	B16; D16; O11; P11	Goose dung	x
Blumeria graminis (DC.) Speer	2008 [a]	O13	*Poa pratensis*, parasitic on living leaves	x
Cadophora fastigiata Lagerb. & Melin	1972 [d]	B15; F10	14°C sand near driftwood; 22°C tephra	
Cadophora malorum (Kidd & Beaumont) W. Gams	1972 [d]	D11	From 14°C black sand near driftwood	
Ceriosporopsis halima Linder	1965 [c]	*?*	On driftwood, marine fungus	
Cladosporium cladosporioides (Fresen.) G.A. de Vries	2008 [a]	I18	*Honckenya peploides*, on a dead plant	x
Cladosporium macrocarpum Preuss	1972 [d] 2008 [a]	I18; G16	14°C tephra; in *H. pepl.* dead shoots	x
Corniculantispora psalliotae (Treschew) Khons., Thanakitp., & Luangsa-ard	1968 [b] 1972 [d] 2010 [a]	M16-M17; G16; L11-L12; I8-I9	From 14°C light-colored tephra; soil from craters; on a mouldy agaric	x

Table 3, continued

Dinemasporium marinum Sv. Nilsson	1965 [c]	*?*	On driftwood, marine fungus	
Epicoccum nigrum Link	1972 [d]	H12	42°C tephra with green surface	
Halokirschsteiniothelia maritima (Linder) Boonmee & K. D. Hyde	1965 [c]	*?*	On driftwood, marine fungus	
Lamprospora miniata De Not.	1990 [i]	J13	On short moss on palagonite	x
Leptosphaeria elymi P. Larsen	2008 [a]	L17	*Leymus arenarius*, overwintered	x
Lophodermium alpinum (Rehm) Weese	2008 [a]	N16	*Leymus arenarius*, overwintered	x
Lulworthia medusa (Ellis & Everh.) Cribb & J.W. Cribb	1965 [c]	*?*	On driftwood, marine fungus	
Octospora axillaris (Nees) M.M. Moser	1990 [i]	O17	At *Bryum* moss by some fishbones	x
Onygena corvina Alb. & Schwein.	1994 [i]	L12	Regurgitated pellet f. predat. bird	x
Paraboeremia putaminum (Speg.) Qian Chen & L. Cai	1968 [b]	L11-L12; I8-I9	From soil in craters	
Penicillium citrinum Thom	1968 [b]	L11-L12; I8-I9	From soil in craters	
Penicillium palitans Westling	1972 [d]	E13	From 17°C soil of a dry pond	
Peziza varia (Hedw.) Röhl.	1990 [i]	M15	On concrete foundations of Pálsbær hut	x
Pleospora eleocharidis P. Karst.	2008 [a]	P12	*Poa pratensis*, overwintered	x
Pleospora junci Pass. & Beltrani	2008 [a]	N15	*Juncus arcticus,* overwintered	x
Schizothecium vesticola (Berk. & Broome) N. Lundq.	2008 [h]	D16; P11	Goose dung	x
Sordaria fimicola (Roberge ex Desm.) Ces. & De Not.	2008 [h]	D16	Goose dung	x
Sordaria minima Sacc. & Speg.	2008 [h]	D16	Goose dung	x
Stemphylium botryosum Wallr.	2008 [a]	O14	*Cochlearia officinalis*, overwintered	x
Stemphylium vesicarium (Wallr.) E.G. Simmons	2008 [h]	P11	Goose dung	x
Talaromyces aerugineus (Samson) Yilmaz, Frisvad & Samson	1996 [e]	*?*	From soil	
Thelebolus stercoreus Tode	2008 [h]	B16; D16; P11	Goose dung	x
Trichoderma harzianum Rifai	1972 [d]	I9; M13	42°C soil, crat. edge; 24°C red lava	
Trichoderma viride Pers.	1972 [d]	I9; E14	42°C soil, crat. edge; driftwood	
Fungi Basidiomycota				
Agaricus arvensis Schaeff.	2010 [a]	P13	In grass on lava ridge	x
Arrhenia rustica (Fr.) Redhead, Lutzoni, Moncalvo & Vilgalys	1990 [i] 2008 [g]	O14; P14; J13; I8; K12; M11	In biological crust at edge of gull colony	x
Ceriporia reticulata (Hoffm.) Domański	2008 [a]	D15	On driftwood, decay fungus	x
Deconica subviscida Peck	2008 [g]	M16-M17; M18	*Leym. aren.,* dead, saproph. fungus	x
Entoloma sericellum (Fr.) P. Kumm.	2010 [a]	P13	Heathland veg. in gull colony	x
Entoloma sericeum Quél.	2005 [i] 2008 [g]	O11; O13; P11; P12	In grassland in the gull colony	x
Galerina pseudomycenopsis Pilát	2015 [a]	O12	*Leym. aren*., dead, saproph. fungus	x
Gamundia xerophila (Luthi & Röllin) Raithelh. ex P.A. Moreau & Courtec.	2010 [a]	P13	In heathland-like vegetation in gull colony	x
Hebeloma marginatulum (J. Favre) Bruchet	2008 [g]	I9	Ectomycorrhizal with *Salix*	x
Hebeloma mesophaeum (Pers.) Quél.	2005 2008 [g]	I8; I9; O14	Ectomycorrhizal with *Salix*	x
Hebeloma vaccinum Romagn.	2008 [g]	O13	Ectomycorrhizal with *Salix*	x
Hebeloma velatum (Peck) Peck	2008 [g]	O12	Ectomycorrhizal with *Salix*	x
Hygrocybe conica (Schaeff.) P. Kumm.	2010 [a]	P13	In heathland veg. in gull colony	x
Inocybe lacera (Fr.) P. Kumm.	2008 [g]	O13	Ectomycorrhizal with *Salix*	x
Laccaria laccata (Scop.) Cooke	2005 2008 [g]	I8; O12	Ectomycorrhizal with *Salix*	x
Laetisaria fuciformis (Berk.) Burds.	2008 [h]	O11	Goose dung	x

Table 3, continued				
Lichenomphalia cf. *velutina* (Quél.) Redhead, Lutzoni, Moncalvo & Vilgalys	1971 [i]	I9	A lichen	x
Neolentinus lepideus (Fr.) Redhead & Ginns	2012 [a]	E16	On driftwood, decay fungus	x
Panaeolus fimicola (Pers.) Quél.	2010 [a]	P11; P12	Lush grassland, oldest part of gull col.	x
Panaeolus olivaceus F.H. Møller	2010 [a]	P11	Lush grassland, oldest part of gull col.	x
Puccinia festucae Plowr.	2008 [a]	P14	*Fest. rich.*, parasitic on living plant	x
Fungi Glomeromycota				
Glomus hoi S.M. Berch & Trappe	1997 [f]	*?*	AM mycorrhiz. fungus of *L. aren.*	
Scutellospora dipurpurescens J.B. Morton & Koske	1997 [f]	*?*	AM mycorrhiz. fungus of *L. aren.*	
Fungi Mucoromycota				
Lichtheimia corymbifera (Cohn) Vuill.	1972 [d]	J8	From 24°C black soil at crater border	
Mucor hiemalis Wehmer	1972 [d]	M13	24°C moss-covered red lava stones	
Chromista Oomycota				
Aphanomycopsis bacillariacearum Scherff.	1965 [c]	*?*	On an algae on beach	
Peronospora alsinearum Casp.	2008 [a]	P14	On *Stellaria media*, dead plant parts	x
Peronospora honckenyae (Syd.) Syd.	2008 [a]	C16	Living *H. pepl.,* parasitic fungus	x
Protozoa Myxomycota				
Didymium spongiosum (Leyss.) J.M. García-Martín, J.C. Zamora & Ladó	2010 [a]	P12	In lush grassland in oldest part of gull colony	x

[a] Eyjólfsdóttir & Lipiński, 2025; [b] Schwabe, 1970; [c] Johnson & Cavaliere, 1968; [d] Henriksson & Henriksson, 1974; [e] Klamer *et al.*, 2000; [f] Greipsson *et al.* 2002; [g] Eyjólfsdóttir 2008; [h] Richardson, 2011; [i] Baldursson & Ingadóttir (eds), 2007; [j] MycoBank Database.

organisms. This article adds some microfungi on overwintered plants and parasitic fungi on plants, bringing the total to 64 species of fungi and fungal-like organisms 45 of which are stored in the AMNH fungarium (Table 3). In addition at least seven species of macrofungi have not been identified to species.

From the more recent sequencing work of Almeida *et al.* (2022) it is clear that there are numerous other fungi on Surtsey some of which might produce sporocarps above ground. Documenting the development of the funga of Surtsey is a project that should continue for many years to come.

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