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Species diversity and resource relationships of South Georgian fungi

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Abstract: The occurrence and distribution of the South Georgia fungal flora, particularly Ascomycotina and Basidiomycotina, is assessed in terms of habitat and substrate preference. The 113 taxa reported comprise 37 basidiomycetes, 49 ascomycetes, six myxomycetes and at least 21 lower fungi. Peat and litter substrata associated with tall tussock grassland have a rich macro-fungal flora, and numerous species occur in bog and mire communities, some in abundance from mid to late summer. Many micro-fungi and ascomycetes colonize dying leaves and inflorescences of specific vascular plants, and a few colonize bryophytes and lichens. At least a dozen species, probably non-indigenous, are associated with rotting timber and other imported materials at former whaling stations. An intensive survey of the South Georgia mycoflora is necessary to gain better understanding of their role in decomposition and nutrient cycling processes in the principal plant communities.

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Introduction

Mycological studies in the southern polar regions have been few and restricted mainly to taxonomic documentation of ascomycetes and basidiomycetes. The most comprehensive taxonomic account of subantarctic macrofungi was provided by Pegler *et al.* (1980). Using much the same database for the agarics only, Horak (1982) adopted a more ecological and phytogeographical approach. Fewer studies have focused in any detail on the biology and ecology of fungi and their role in the decomposition cycle (e.g. Bailey & Wynn-Williams 1982, Hurst 1982 and subsequent papers, Kerry & Weste 1985). Most recent work has been undertaken on the subantarctic island of South Georgia where substantial collections of higher fungi (basidiomycetes, ascomycetes) and occasional myxomycetes have been made (Pegler *et al.* 1980, Ing & Smith 1980, 1983). Systematic listings of fungal taxa are also available for Iles Kerguelen (and some from Iles Crozet) (Berkley 1847, 1877a,b, Hennings 1906) and Macquarie Island (Bunt 1965, Kerry 1984, Kerry & Weste 1985, Stephenson *et al.* 1992). Although each island is situated at approximately 54°S, South Georgia lies about 250 km south of the Polar Frontal Zone and therefore has a much colder climate.

South Georgia (54–55°S, 36–38°W) is a large mountainous island with a heavily glacierized and glaciated topography, of which about 60% is permanently ice-covered, and a cold oceanic-temperate climate (Smith & Walton 1975). Coastal areas are snow-free for 4–6 months and support a tundra-like vegetation dominated by tall tussock grassland, wet and dry short grassland, bog, mire, and dwarf-shrub herbfield, and sparsely vegetated fellfield (Greene 1964, Smith 1984). The native vascular flora comprises nine graminoids, three suffruticose herbs of the genus *Acaena* (usually referred to as dwarf shrubs), six forbs and seven pteridophytes (Smith & Walton 1975). Some adventive European species, have become naturalized, notably around the six abandoned whaling stations, (Walton & Smith 1973, Headland 1987). There is a diverse cryptogamic flora.

No detailed survey of the higher fungi of South Georgia has been undertaken. This account is based on various collections of sporocarps made by the author and other biologists, and held in the British Antarctic Survey (BAS) herbarium and/or at the Royal Botanic Gardens, Kew or the International Mycological Institute, Egham. The purpose of this paper is to provide a comprehensive listing of the island's currently known fungal flora, and relate this to the specific habitats and substrata in which they occur. This is not intended to be a taxonomic treatise as descriptions of the species may be found elsewhere.

In the following account the term *resource* is used *sensu* Swift *et al.* (1979) for any material which sustains fungal growth, and *substratum* for the medium which physically supports the fungus. The absence of a species from a particular resource-type does not necessarily imply that it does not occur there. Specimens have been collected primarily to represent different taxa encountered and not as a detailed systematic survey of the fungal components of different habitats or plant communities. A systematically arranged list of taxa, comprising mainly macrofungi, is given in Appendix 1 but, while containing all those taxa so far recorded, it is considered very incomplete.

Fungi associated with different habitat- and resource-types

Mineral soil

Few species appear to grow directly on mineral substrata (Table I). For most higher fungi the fruit bodies arise from small

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Table I. Fungi growing in different habitat-types.

	Habitat*						
	1	2	3	4	5	6	7
Asomycotina							
Albotricha acutipila			x				
Dasyscyphus cf. *enzenspergerianus*			x				
Hymenoscyphus chloophilus			x				
Lamprospora cf. *cashiae*					x		
Octospora cf. *leucoloma*	x						
Scutellinia doelloi	x	x			x		
S. kerguelensis	x	x					x
S. patagonica	x	x		x	x		x
Wentiomyces inconspicuus			x				
Basidiomycotina							
Agrocybe limonia		x					
A. praecox			x				
A. semiorbicularis		x	x	x			
Collybia sp.			x				
Coprinus martinii			x		x		x
C. stercoreus					x		
Favolaschia antarctica		x	x				
Galerina antarctica		x	x	x			
G. moelleri	x	x	x	x	x		
G. perrara		x	x				
G. pumila				x			
G. vittiformis					x		
Gerronema schusteri						x[1]	
Hyphyloma elongatum		x	x				x
H. ericaeum		x	x		x		
Leptoglossum lobatum var. *antarctica*			x				
Marasmius haematocephalus[2]		x					
Mycena bulbosa			x				
Omphalina antarctica	x	x	x	x	x		
O. ericetorum			x		x		
Panaeolus papilionaceus		x					
P. acuminatus				x			
Phaeogalera stagnina			x	x	x		x
Phaeotellus cf. *griseopallidus*						x[3]	
Pholiota myosotis		x		x	x		x[4]
Pistillaria capitata			x				
Pistillina hyalina			x				
Psilocybe inquilina			x				
P. merdaria		x					
Rickenella mellea	x				x		
Cyphellaceae sp. (?*Puccinia poae-nemoralis*)			x				
Myxomycota							
Lamproderma arcyrioides	x[5]						
Stemonitopsis subcaespitosa			x				

* Key to habitat-types. 1: Mineral soil; 2: Biotically disturbed *Parodiochloa flabellata* peat; 3: Litter in *P. flabellata* grassland; 4: *Deschampsia antarctica* grassland; 5: *Rostkovia magellanica*-bryophyte bog; 6: *Juncus scheuchzerioides*-bryophyte mire; 7: Litter in *Acaena magellanica* herbfield. Key to superscripts. [1] Amongst *Juncus* and *Schistochila* sp.; [2] The earliest record of a higher fungus from South Georgia (Taylor 1914) from tussock grass litter at Bay of Isles, but requires confirmation as it has a predominantly tropical-subtropical distribution (Pegler *et al.* 1980); [3] Amongst *Juncus* and *Calliergon sarmentosum*; [4] On *Acaena*-*Tortula robusta* litter in abandoned gentoo penguin colony; [5] On underside of boulder.

fragments of organic matter or decayed moss embedded in the soil, commonly close to stream margins which may be flooded from time to time. The three ascomycetous species (*Scutellinia*) within this group produce small but distinctive orange-red apothecia.

Litter, peat and moss in major plant communities

The dominant coastal vegetation is a zone of tall (up to 2 m in height), very long-lived winter-green tussock grass *Parodiochloa flabellata* (= *Poa flabellata*) which develops a pedestal of peat from the decayed foliage and in which most of the root system of the plant exists. Where the grass is densest the spreading leaves form an almost continuous canopy, although the bases of the plants are usually a metre or more apart. The combined macrofungal flora for this grassland resource (excluding attached dead foliage) comprises seven ascomycetes, 24 basidiomycetes and one myxomycete.

The depressions between the peat pedestals often retain water and are favoured by elephant seals (*Mirounga leonina*) as wallow sites. Fur seals (*Arctocephalus gazella*) utilize the crests of pedestals as resting places. In the larger, more regularly used wallows, faeces, hair and patches of moulted skin become incorporated into the wet acidic peat. Where seal disturbance is less severe, the base of the tussock pedestals are commonly colonized by mats of *Callitriche antarctica*, and occasionally by *Ranunculus biternatus*, *Acaena magellanica*, *Deschampsia antarctica* and several bryophytes. Numerous fungi, especially basidiomycetes, occur on this biotically disturbed peat, particularly in late summer (Table I).

In tussock grassland beyond the influence of seals, but often affected to some degree by surface- or burrow-nesting seabirds (various albatrosses and petrels), the loose fibrous grass litter which accumulates beneath and around the low pedestals supports the most diverse fungal flora, particularly of basidiomycetes, on South Georgia (Table I). The sporocarps generally arise from a mycelial network in the underlying decaying litter.

The short grass *Deschampsia antarctica* is one of the most widespread phanerogams on South Georgia. It commonly forms a fringe around the base of *Parodiochloa* pedestals with *Callitriche antarctica*. Elsewhere, in wet areas it forms continuous lawns with occasional *Acaena magellanica* and bryophytes. Several fungi have been found associated with the litter of this grass (Table I).

Bogs occur where drainage is impeded and where tall turf-forming mosses have built up a deep peat of 1–3 m deep (Smith 1981). Mires typically occur on freely drained slopes where the bryophyte ground cover has accumulated no more than about 10–20 cm of peat which remains unconsolidated. The pH of bog peat is usually 4.2–5.2, while that of mires is richer in calcium and has a pH ranging from 5.5–6.0, occasionally reaching 7.0. Fungi are occasionally seen, even amongst the wettest vegetation, but almost invariably the fruit bodies are attached to shoots of moss (Table I).

Dense stands of the deciduous *Acaena magellanica*-dominated herbfield occur on sheltered, generally well-drained slopes. Where the canopy is not too dense there is usually an understorey of the mosses *Tortula robusta* and *T. serrata.* Where the substratum is moister *Acaena* tends to be more open and there is a continuous ground cover of moss. *Aceana* leaves decompose rapidly, implying a highly active microbiota in the litter but higher fungi are generally scarce (Table I).

Poa annua is considered to be a naturalized alien species introduced during the whaling era (1904–1965), or possibly during the sealing era of the early 19th century. Only two fungi, the basidiomycetes *Omphalina ericetorum* and *Panaeolus acuminatus*, have been noted on litter in such swards.

The tall turf-forming moss *Polytrichum alpestre* develops extensive stands on level to gently sloping ground, accumulating an amorphous and strongly acidic (pH 3.5–4.0) peat which may reach 1–2 m depth. Fungi are generally scarce but occasionally arise from the moribund moss shoots 1–2 cm below the green moss apices. Although only two basidiomycete species (*Galerina perrara* and *Phaeogalera stagnina*) are reported here, others are known to colonize this moss on South Georgia.

Individual plant species

Most of the island's phanerogam and pteridophyte flora has been observed to become colonized by ascomycetous and lower fungi (Tables II, III). This is particularly noticeable in the grasses, rushes and other graminoid species (Table III). Inoculation generally occurs while the foliage or inflorescences are still green and metabolically active, although visual signs of their occurrence through the presence of reproductive structures do not usually manifest themselves until these organs begin to die. Indeed, their senescence may be enhanced by the action of the fungi. Walton (1977) noted that *Ovularia* sp. is saprophytic on senescing *A. magellanica* leaves and suggested that it may hasten decomposition. Hurst *et al.* (1983) have shown that there is a succession of phylloplane fungi on senescing *Acaena magellanica*, *Festuca contracta* and *Parodiochloa flabellata.* Infected standing dead material of most native and naturalized alien vascular plants investigated has yielded numerous fungi, many, especially of the ascomycetes, being apparently host-specific. *Lanzia caryopsicola* is known only on the seed cases of grasses (*Festuca contracta* and *Parodiochloa flabellata*). The rust *Puccinia brachypodii* var. *poae nemoralis* is common on the leaves of *P. flabellata* and *Phleum alpinum*, but has not been known to reach epidemic proportions on the former grass as it does in the Falkland Islands.

Numerous macrofungi have been recorded arising from individual shoots of bryophytes (Table IV). The three species of *Scutellinia* listed in Table I, have each been recorded on live and decaying moss as well as on adjacent mineral soil. Most of the species occurring in bog and mire communities are attached to mosses, notably *Calliergidium austro-stramineum, Calliergon sarmentosum, Chorisodontium aciphyllum, Dicranoloma* spp., *Drepanocladus uncinatus, Polytrichum* spp., and *Tortula robusta.*

The thalli of several lichens are known to be parasitized by ascomycetous fungi. Lindsay (1974) reported *Discothecium gemmiferum* on *Caloplaca dimorpha* and *Xanthoria elegans*, especially on the apothecial discs, and *Guignardia* sp. forming galls on the podetia of *Cladonia furcata.* Zahlbruckner (1917) reported two varieties of *D. gemmiferum* growing on species of *Coloplaca* on South Georgia. Lindsay also described a species of *Lecidea* forming conspicuous black galls on *Usnea antarctica.* Several other South Georgian lichens are known to be parasitized by fungi (D.O. Øvstedal, personal communication 1991).

Table II. Fungi associated with non-graminoid vascular species (those marked * are taken from Hurst *et al.*, 1983, and + from Walton, 1977).

	Acaena			*Rb*	*Cf*	*Pm*	*Pol*
	Lv	Sc	Wst	Lv	Lv St	St	Fr[1]
Deuteromycotina							
Alternaria sp.*	x						
*Aureobasidium pullulans**	x						
*Botrytis cinerea**	x						
Chaetophoma spp.*	x						
*Cladosporium herbarum**	x						
*C. sphaerospermum**	x						
*Fusarium lateritium**	x						
*Geomyces pannorum**	x						
Ovularia sp.+	x						
Penicillium spp.*	x						
Peyronellea sp.*	x						
Phialophora sp.*	x						
Zygomycotina							
Mortierella spp.*	x						
*Mucor hiemalis**	x						
Sterile mycelia*	x						
Ascomycotina							
Gnomonia acaenae		x					
Leptosphaeria eustoma					x		
Hymenoscyphus chloophilus			x[2]				
Microthyrium sp.							x
Pleospora herbarum					x		
Wentiomyces cf. *javanicus*		x					
Unidentified ascomycete*	x					x	
Basidiomycotina							
Phaeogalera stagnina			x[2]				
Urocystis anemones				x			
Myxomycota							
Diderma niveum			x				
?Lamproderma sp.			x				

[1] Lv: leaves, Sc: scape, Wst: woody stem, St: stem, Fr: frond
[2] On woody stems of *Acaena* amongst *Parodiochloa flabellata.*

Acaena: *Acaena magellanica*, *Rb*: *Ranunculus biternatus*, *Cf*: *Cerastium fontanum* (alien), *Pm*: *Plantago media* (alien), *Pol*: *Polystichum mohrioides* (fern).

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Table III. Fungi colonizing dead leaves and culms of native and alien graminoids (species marked with an asterisk are taken from Hurst *et al.* 1983).

	Fc	*Pf*	*Pa*	*Js*	*Rm*	*Um*	*At*	*Dc*	*Poa*
Deuteromycotina									
*Acremonium terricola**		x							
Alternaria sp.*	x	x							
*Aureobasidium pullulans**	x								
*Botrytis cinerea**	x	x							
Chaetomium spp.*		x							
Chaetophoma spp.*	x								
*Cladosporium herbarum**	x	x							
*C. sphaerospermum**	x	x							
*Doratomyces nanus**		x							
*Fusarium lateritium**	x	x							
*Geomyces pannorum**	x	x							
Penicillium spp.*	x	x							
Peyronellea sp.*		x							
Phialophora sp.*	x								
Zygomycotina									
Mortierella spp*		x							
*Mucor hiemialis**	x	x							
Sterile mycelia*	x	x							
Ascomycotina									
Dasycyphus acutipilus		x							
Didymella antarctica	x								
Hysteropezizella antarctica				x					
H. festucae	x								
H. glumicola[1]			x						
H. microsticta				x					
Lanzia antarctica				x					
L. caryopsicola[2]	x	x							
Leptosphaeria eustoma									x
L. juncina				x					
L. sylvatica[3]	x								
Leptosphaeria spp.*		x							
Lophodermium alpinum	x	x							
Microthyrium culmigenum				x					
M. fuegianum					x				
Mollisia maculans			x						
Morenoina antarctica	x								
Mycosphaerella recutita				x		x			
M. tassiana			x						
Phyllachora graminis[3]		x							
Pleospora heleocharidis		x	x				x		
P. togwotiensis								x	
Stomiopeltis cf. *antarctica*[3]					x				
Wentiomyces inconspicuus		x							
Unidentified ascomycete*	x	x							
Basidiomycotina									
Puccinia brachypodii var. *poae nemoralis*[3]		x	x						
Myxomycota									
Didymium dubium	x				x				
Diderma niveum					x				

[1] On glumes of seeds; [2] On caryopsis; [3] Also on living green leaves.

Fc: *Festuca contracta*, *Pf*: *Parodiochloa flabellata*, *Pa*: *Phleum alpinum*, *Js*: *Juncus scheuchzerioides*, *Rm*: *Rostkovia magellanica*, *Um*: *Uncinia meridensis*, *At*: *Agrostis tenuis* (alien), *Dc*: *Deschampsia caespitosa* (alien), *Poa*: *Poa annua* (alien).

Table IV. Fungi associated with individual bryophyte species.

Ascomycotina
- *Hymenoscyphus austrobryus* (on *Conostomum pentastichum*, apparently exclusive to this moss)
- *Lanzia antarctica* (on unidentified moss on moraine)
- *Leucoscypha sphaerospora* (on unidentified moss by waterfall)
- *Scutellinia kerguelensis* (on *Skottsbergia paradoxa* on fine gravel)
- *Thyronectria hyperantarctica* (on *Conostomum pentastichum*, *Drepanocladus uncinatus*)

Basidiomycotina
- *Galerina moelleri* (on *Chorisodontium aciphyllum* turf bank, *Skottsbergia paradoxa* on fine gravel, *Tortula robusta* in mire)
- *G. perrara* (on *Chorisodontium aciphyllum* turf bank)
- *Gerronema schusteri* (on *Polytrichum alpinum* turf, *Skottsbergia paradoxa* with *Schistochila* sp. on fine gravel)
- *Hypholoma elongatum* (on *Tortula robusta* in mire)
- *H. ericeum* (on *Calliergon sarmentosum* floating at margin of lake)
- *Leptoglossum lobatum* (on *Drepanocladus uncinatus* and *Calliergon sarmentosum* in bog, ?*Pseudoleskea* sp. in fellfield flush)
- *Omphalina antarctica* (on *Chorisodontium aciphyllum* turf bank)
- *O. ericetorum* (on unidentified moss on gravel)
- *Phaeogalera stagnina* (on *Drepanocladus uncinatus* and *Calliergon sarmentosum* in bog)
- *Pholiota elongatum* (on *Warnstorfia* cf. *exannulata* floating at margin of lake)
- Unidentified agaric, possibly *Omphalina antarctica* (on *Polytrichum alpinum* turf, *Tortula robusta* in mire)

Myxomycota
- *Diderma niveum* (on *Polytrichum alpinum*)

Table V. Fungi associated with imported timber.

Ascomycotina
- *Chlorociboria* cf. *aeruginascens*
- *Coniochaeta lignaria*
- *Mollisia* sp.
- *Hyaloscypha hyalina*
- *Nectria* sp.
- *Peziza micropus*
- *Tapesia livido-fusca*

Basidiomycotina
- *Coriolus versicolor*
- *Dacrymyces stillatus*
- *Schizopora paradoxa*
- Unidentified white sterile rhizomorphs in rotting timber

Myxomycota
- *Comatricha nigra*
- *Lycogala* sp.

Introduced substrata

Lignicolous fungi have been found on planking of piers, whale plans, buildings in various stages of ruin and isolated pieces of wood lying on soil or peat (Table V). Most are ascomycetes, but a few basidiomycetes typical of rotting wood have also been recorded. *Peziza cerea* has been found on pieces of coal at Husvik whaling station whilst two species of ascomycete (*Mytilidion mytilinellum* and *Nectria* cf.

episphaeria) have been recorded together on whalebone at Grytviken whaling station.

No higher fungi have been found associated directly with the faeces of native fauna (i.e. seals or birds). However, two coprophilous basidiomycete species (*Psilocybe coprophila* and *Psilocybe merdaria*) and the small orange ascomycete *Cheilymenia coprinaria* var. *megaspora* are commonly found growing on decaying reindeer dung. A third basidiomycete (*Coprinus martinii*) was found growing adjacent to dung amongst *Juncus*.

Discussion

This account lists over 100 taxa of fungi, most at species level (37 basidiomycetes, 49 ascomycetes, six myxomycetes and at least 21 lower fungi, excluding sterile mycelia and mycorrhizas) recorded from a variety of habitats and substrata on South Georgia (Appendix 1). Since no comprehensive survey has been undertaken of the fungal flora of the island's main plant communities, the actual number of species can be expected to be very much greater, particularly as regards the lower fungi. Nevertheless, assessing the known fungal flora in terms of the habitat characteristics of each taxon has permitted some interpretation of their resource preferences.

Despite inequalities in collecting it is clear that the *Parodiochloa flabellata* ecosystem of long-lived tall tussock-forming grass provides a range of very favourable resource-types for fungi. This is probably due to the moist sheltered nature of the habitat and to the acidic peat which is often enriched with nitrogen and phosphate by birds and seals, combined with the high soluble carbohydrate levels in the live leaf bases (Gunn & Walton 1985) which may leach into the peat below. The litter itself has a low soluble carbohydrate concentration in comparison with that of *Acaena magellanica* (Hurst *et al*. 1985). Standing dead leaves and detached litter of *Parodiochloa* support a rich flora of microfungi and ascomycetes, while the detached litter and associated peat have a remarkably diverse basidiomycete flora.

No other community or ecosystem possesses such a diverse flora of fruiting higher fungi as the tussock grassland. However, a relatively large number of basidiomycetes occur in bog communities dominated by *Rostkovia magellanica* and bryophytes. *Deschampsia antarctica* swards and *Acaena magellanica* herbfield also have a relatively rich flora. The major phanerogam-dominated ecosystem from which no saprotrophic higher fungi appear to have been recorded is the relatively dry *Festuca contracta* grassland. While basidiomycetes begin to appear in the wetter habitats from mid-December onwards, the litter-inhabiting higher fungi, particularly those in stands of tussock grass, tend to appear later in the summer.

Several higher fungi occupy quite a wide range of habitats, e.g. *Agrocybe semiorbicularis*, *Coprinus martinii*, *Galerina antarctica*, *G. moelleri*, *G. perrara*, *Hypholoma ericaeum*, *Omphalina antarctica*, *Phaeogalera stagnina*, *Pholiota myosotis*, *Scutellinia doelloi*, *S. kerguelensis*, *S. patagonica*. Those which appear to be highly restricted in their distribution may be more widespread, but have so far been overlooked. Many ascomycetes colonize the aerial parts of phanerogams, with the fruit bodies manifesting themselves particularly when the plant organ begins senescing. A high proportion of these fungi appear to be host-specific or, in some instances, graminicolous or bryophilous. Numerous taxa of cryotolerant lignicolous macrofungi occur on rotting wood associated with the whaling stations. Some of these have probably been introduced as spores or mycelium in imported timber and other anthropogenic materials.

Although several studies of decomposition in major plant communities on South Georgia have been undertaken (e.g. Lawson 1985, 1988, Walton 1985, Smith & Walton 1986), most of the decay process was attributed to the action of bacteria, yeasts and microfungi. However, it seems probable that basidiomycetes also play a central role as decomposers of cellulose and lignin.

As yet, the role of mycelia in the decomposition and nutrient cycles of the principal terrestrial ecosystems of South Georgia is unknown. Although nine native South Georgia angiosperm species have been found to have vesicular-arbuscular mycorrhizas (zygomycetes) and seven of these also showed infection by a fine endophyte (*Glomus tenue*; Christie & Nicolson 1983), nothing is known of their possible role in nutrient capture or in the health and survival of their hosts. This assessment of the mycoflora clearly illustrates the need for a more intensive study in order for these dynamic processes to be better understood, both on this isolated subantarctic island and for comparison with other subantarctic islands and northern tundra regions.

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Appendix 1. Fungal taxa recorded at South Georgia (species marked with an asterisk have been described elsewhere as new to science)

Deuteromycotina

Coelomycetes
- *Chaetophoma* spp.
- *Pyronellea* sp.

Hyphomycetes
- *Acremonium terricola* (Miller *et al.*) W. Gams
- *Alternaria* sp.
- *Aureobasidium pullulans* (de Bary) Arnaud
- *Botrytis cinerea* (Pers.: Fr.) Rabenh.
- *Chaetomium* spp.
- *Cladosporium herbarum* (Pers.) Link
- *C. sphaerospermum* Penzig
- *Doratomyces nanus* (Ehrenb.) Morton & Smith
- *Fusarium lateritium* Nees
- *Geomyces pannorum* (Link) Sigler & Carm. (formerly *Chrysosporium pannorum* (Link) Hughes
- *Ovularia* sp.
- *Penicillium* spp. (including *P. chrysogenum* Thom and *P. waksmanii* Zaleski)
- *Phialophora* sp.

Zygomycotina

Zygomycetes
- *Mortierella* spp.
- *Mucor hiemalis* Wehmer

Ascomycotina

Dothideales
- *Didymella antarctica* Spooner*
- *Discothecium gemmiferum* (Tayl.) Vouaux
- *Guignardia* sp.
- *Leptosphaeria eustoma* (Fckl.) Sacc.
- *L. juncina* (Auersw.) Sacc.
- *L. sylvatica* Pass.
- *Microthyrium culmigenum* Syd.
- *M. fuegianum* Speg.
- *Morenoina antarctica* (Speg.) Theiss.
- *Mycosphaerella recutita* (Fr.) Johans.
- *M. tassiana* (de Not.) Johans.
- *Mytilidion mytilinellum* (Fr.) Zogg
- *Pleospora heleocharidis* Karst.
- *P. herbarum* (Fr.) Rab.
- *P. togwotiensis* Wehm.
- *Stomiopeltis* cf. *antarctica* (Speg.) von Arx
- *Wentiomyces inconspicuus* Spooner*
- *W.* cf. *javanicus* Kooders

Diaporthales

Diaporthaceae
- *Gnomonia acaenae* Spooner*

Hypocreales

Hypocreaceae
- *Nectria* sp.
- *N. episphaeria* (Tode: Fr.) Fr.
- *Thyronectria hyperantarctica* (D. Hawksw.) D. Hawksw. & Spooner

Phyllachorales

Phyllachoraceae
- *Phyllachora graminis* (Pers.: Fr.) Fckl.

Sordariales

Sordariaceae
- *Coniochaeta ligniaria* (Grev.) Massee

Leotiales

Dermateaceae
- *Hysteropezizella antarctica* Dennis*
- *H. festucae* Dennis*
- *H. glumicola* Dennis*
- *H. microsticta* Dennis*
- *Mollisia* sp.
- *M. maculans* (Rehm.) Rehm.
- *Tapesia livido-fusca* (Fr.) Rehm.

Leotiaceae
- *Chlorociboria* cf. *aeruginascens* (Nyl.) Kanouse
- *Hymenoscyphus austrobryus* Spooner*
- *H. chloophilus* Spooner*

Hyaloscyphaceae
- *Albotricha acutipila* (Karst.) Raitv. (formerly *Dasyscyphus acutipilus* (Karst.) Sacc.)
- *D. enzenspergerianus* (P. Henn.) Dennis
- *Hyaloscypha hyalina* (Pers.) Boud. ss auct.

Sclerotiniaceae
- *Lanzia antarctica* Spooner*
- *L. caryopsicola* Spooner*

Pezizales

Pyronemataceae
- *Cheilymenia coprinaria* var. *megaspora* Gamundi
- *Lamprospora* cf. *cashiae* Gamundi
- *Leucoscypha sphaerospora* Spooner*
- *Octospora* cf. *leucoloma* Hedwig
- *Scutellinia doelloi* (Speg.) Le Gal
- *S. kerguelensis* (Berk.) O. Kuntze
- *S. patagonica* (Rehm.) Gamundi

Pezizaceae
- *Peziza cerea* Sow.
- *P. micropus* Pers.

Rhytismatales

Hypodermataceae
- *Lophodermium alpinum* (Rehm.) Terrier

Basidiomycotina

Dacrymycetales

Dacrymycetaceae
- *Dacrymyces stillatus* Nees: Fr.

Poriales

Polyporaceae
- *Coriolus versicolor* (L.: Fr.) Quél.

Stereales

Hyphodermataceae
- *Schizopora paradoxa* (Schrad.: Fr.) Donk

Botryobasidiaceae
- *Botryobasidium* sp.

Agaricales

Bolbitiaceae
- *Agrocybe limonia* (Cooke & Massee) Pegler
- *A. praecox* (Pers.: Fr.) Fayod
- *A. semiorbicularis* (Bull.) Fayod

Coprinaceae
Coprinus martinii P.D. Orton
C. stercoreus Fr.
Panaeolus acuminatus (Schaeff.) Quél.
P. papilionaceus (Bull.: Fr.) Quél.

Cortinariaceae
Galerina antarctica Singer
G. moelleri Bas
G. perrara Singer
G. pumila (Pers.: Fr.) M. Lange ex Singer
G. vittiformis (Fr.) Singer

Strophariaceae
Hypholoma elongatum (Pers.: Fr.) Ricken
H. ericaeum (Pers.: Fr.) Kuhn.
Phaeogalera stagnina (Fr.) Pegler & Young
Pholiota myosotis (Fr.: Fr.) Singer
P. elongatum (Pers.: Fr.) Ricken
Psilocybe coprophila (Bull. ex Fr.) Kummer
P. inquilina (Fr.: Fr.) Bres.
P. merdaria (Fr.) Ricken

Tricholomataceae
Collybia sp.
Favolaschia antarctica (Speg.) O. Kuntze
Gerronema schusteri Singer
Leptoglossum lobatum (Pers.: Fr.) Ricken var. *antarctica* Horak
Mycena bulbosa Cejp
Omphalina antarctica Singer
O. ericetorum (Fr. : Fr.) M. Lange
Phaeotellus cf. *griseopallidus* (Desm.) Kühn. & Lamoure
Rickenella mellea (Singer & Clemenc.)

Cantharellales

Typhulaceae
Pistillaria capitata (Pers.) Sacc.
Pistillina hyalina Quél.

Uredinales

Cyphellaceae
Puccinia poa-nemoralis Otth

Ustilaginales

Tilletiaceae
Urocystis anemones (Pers.) Wint.

Myxomycota

Comatricha nigra (Pers.) Schroet.
Diderma niveum (Rost.) Macbr.
Didymium dubium Rost.
Lamproderma arcyrioides (Sommerf.) Rost.
Lycogala sp.
Stemonitopsis subcaespitosa (Peck) Nann. Brem.

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