Peeking into the future : fungi in the greening Arctic

Neves Morgado, Luis Miguel das

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Author: Morgado, Luis N.
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Appendices

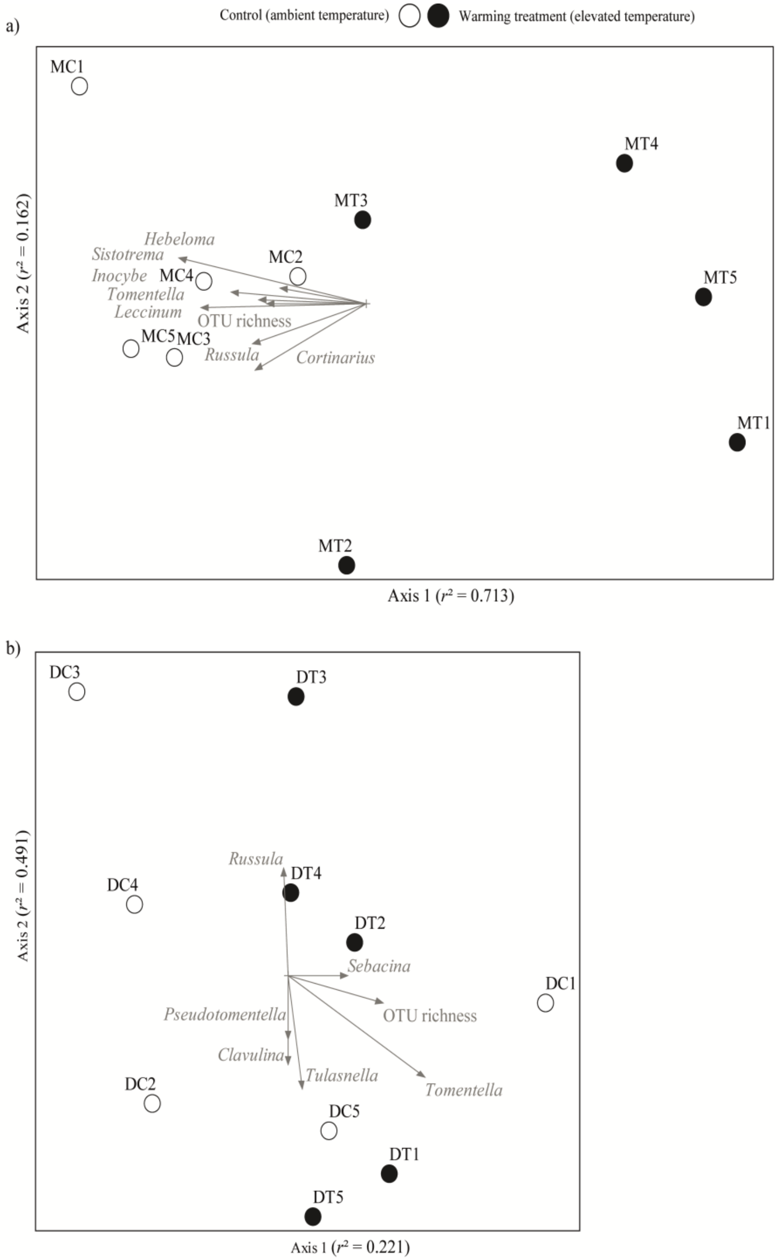


Figure S2.1. a) NMDS analysis with the square-root sequence abundance dataset of the ECM fungal communities of the moist tussock tundra plots with final stress 0.0523, final instability < 0.00001, total r^2 = 0.876 and orthogonality = 96.5%. MRPP *A* = 0.0927 and *p* = 0.0051. b) NMDS analysis of the ECM fungal communities of the dry tundra replicates with final stress 0.1266 and final instability < 0.00001. MRPP *A* = 0.0163 and *p* = 0.1750. Legend: DC – dry control, DT – dry warming treatment, MC – moist tussock control, MT – moist tussock warming treatment.

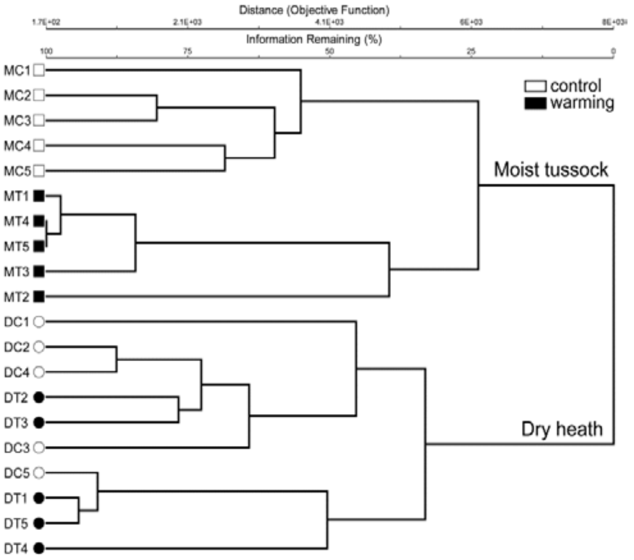


Figure S3.1. Cluster diagram for fungal communities from the warmed and control plots in the dry and moist tundra types.

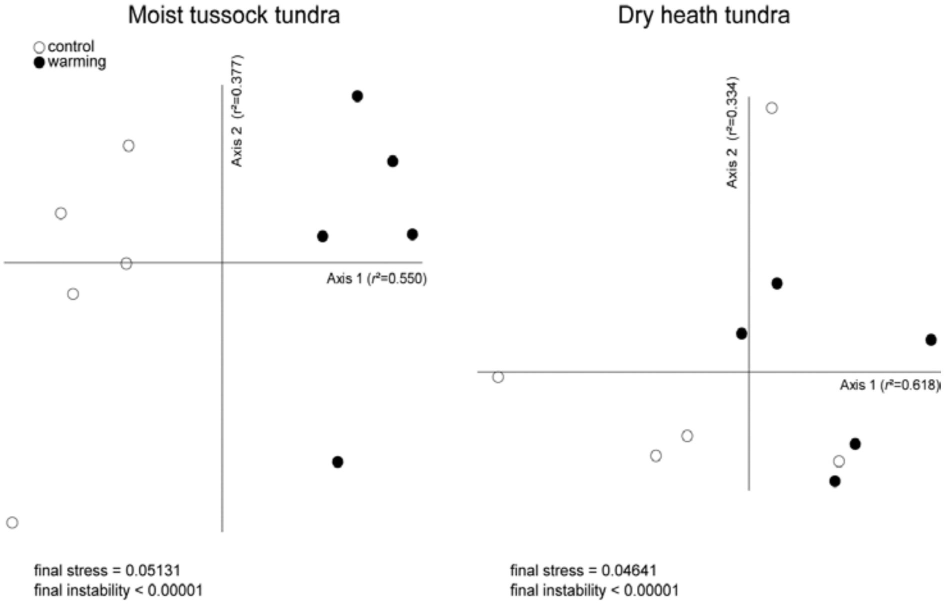


Figure S3.3. Non-metric multidimensional scaling (NMDS) ordination plots for fungal communities from the warmed and control plots in the dry and moist tundra types based on presence-absence.

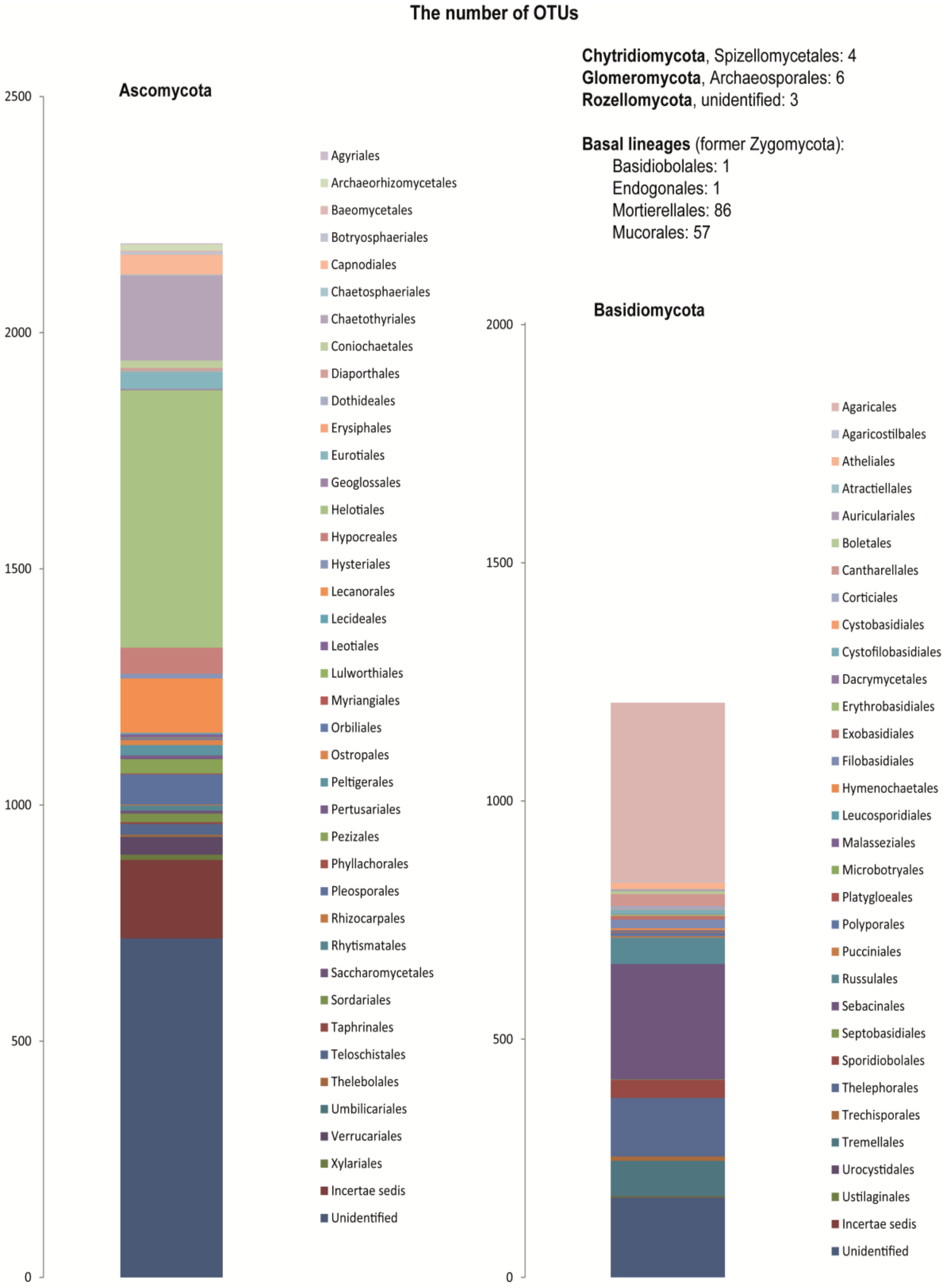


Figure S3.2. The proportional distribution of the 3554 fungal 97% ITS sequence similarity OTUs identified to taxonomic phyla (of 5438 fungal OTUs). Assignment to phyla and taxonomic orders was based on closely related sequences found in the UNITE database.

Table S3.1. OTUs considered as significant indicators of the treatment types with corresponding p-values, and with accession numbers, sequence similarity, pairwise alignment length, name, and taxonomic classification of the most similar sequence in the UNITE+INSD database. Only OTUs with at least 97% ITS2 sequence similarity to a closely related sequence are shown. When multiple OTUs matched the same sequence and were indicators of the same treatment type, only the OTU with the highest sequence similarity to the reference sequence is shown. Where available, the Species Hypothesis (SH) numbers are given for the corresponding sequence as published by Köljalg et al. (2013). Abbreviations for treatments are M=moist tundra, D=dry tundra, C=control, T=warming.

OTU	Treatment	*p*	Accession	%	bp	Name	SH	Order	Phylum
5606	MC	0.0454	HQ446078	98.2	276	*Acephala* sp.	SH234174.06FU	Helotiales	Ascomycota
3355	MC	0.0314	AY204589	98.5	273	*Alatospora acuminata*	SH207334.06FU	Leotiales	Ascomycota
846	MC	0.008	JX984742	99.7	290	*Aureobasidium pullulans*	SH053566.06FU	Dothideales	Ascomycota
1089	MC	0.0204	DQ001277	97.7	299	*Cladonia macroceras*	SH215969.06FU	Lecanorales	Ascomycota
3493	MC	0.025	GU082964	98.5	262	*Cladophialophora* sp.	SH228315.06FU	Chaetothyriales	Ascomycota
201	MC	0.008	EF433981	98.3	350	*Clavaria acuta*	SH262546.06FU	Agaricales	Basidiomycota
281	MC	0.008	EF434000	97.7	258	*Clavaria* sp.	SH201752.06FU	Agaricales	Basidiomycota
43	MC	0.008	EF434027	100	315	Clavariaceae sp.	SH218632.06FU	Agaricales	Basidiomycota
122	MC	0.0456	EF434098	97.7	259	Clavariaceae sp.	SH201751.06FU	Agaricales	Basidiomycota
853	MC	0.008	HQ211947	99.4	178	Clavariaceae sp.	SH203501.06FU	Agaricales	Basidiomycota
3000	MC	0.0456	GU234153	99.6	274	*Coprinus* sp.	SH229041.06FU	Agaricales	Basidiomycota
1229	MC	0.048	GU174325	98.9	280	Dermataceae sp.	SH286768.06FU	Helotiales	Ascomycota
798	MC	0.0456	HQ211766	99.3	285	Dothideomycetes sp.	SH239019.06FU	Capnodiales	Ascomycota
2837	MC	0.008	EF434102	97.3	264	Dothideomycetes sp.	SH227703.06FU		Ascomycota
1676	MC	0.0456	AM901816	99.2	245	*Dothiorella* sp.	SH195688.06FU	Botryosphaeriales	Ascomycota
602	MC	0.0456	GU083075	97.8	277	ectomycorrhizal fungus	SH209187.06FU	Helotiales	Ascomycota
3427	MC	0.035	GU998263	98.6	280	ectomycorrhizal fungus	SH208255.06FU	Helotiales	Ascomycota
634	MC	0.0456	AY112924	99.4	330	ericoid mycorrhizal fungus	SH113701.05FU	Sebacinales	Basidiomycota

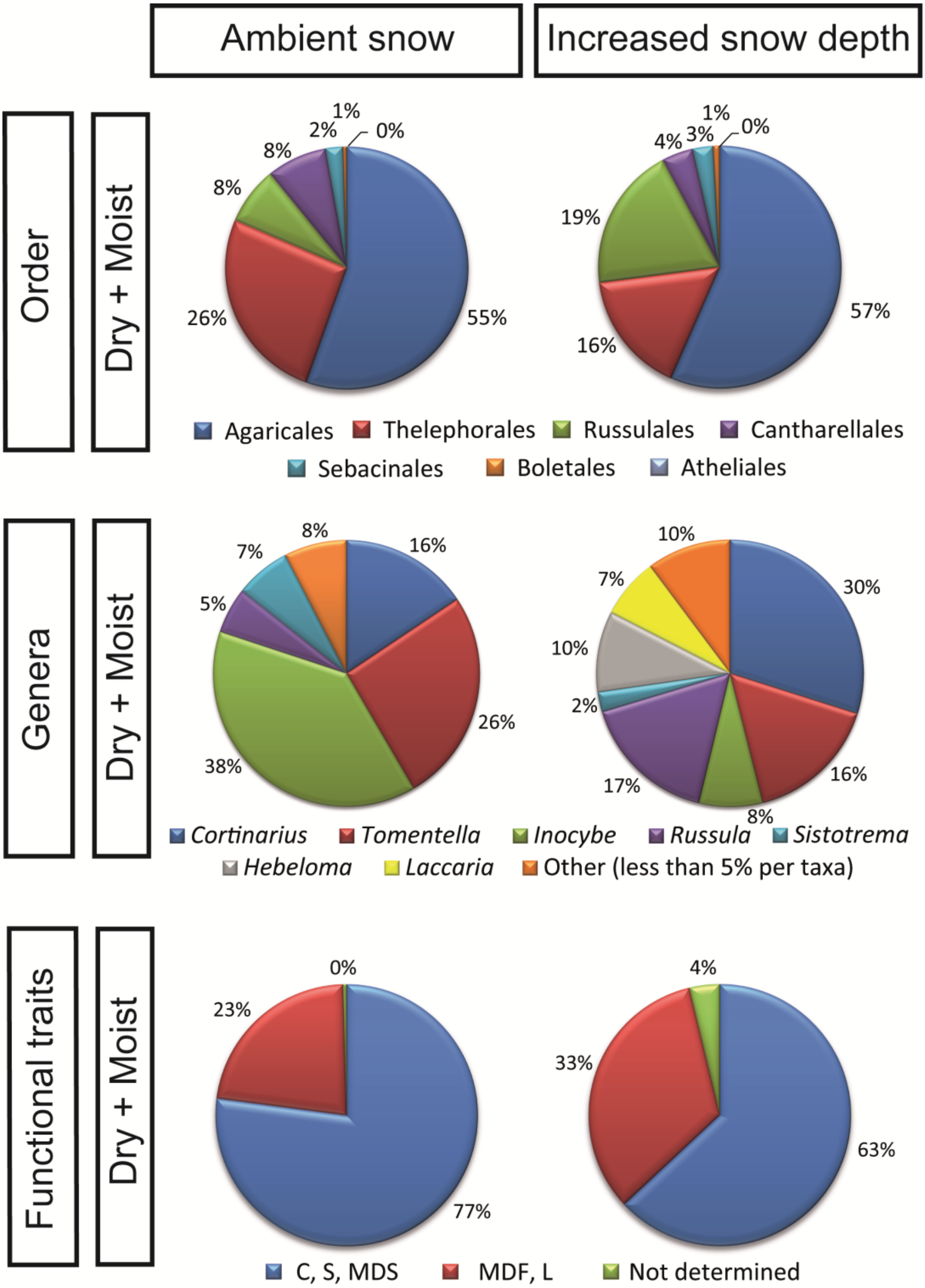
3453	MC	0.0456	EF030927	97.7	216	ericoid mycorrhizal fungus	SH101765.05FU	Sebacinales	Basidiomycota
1058	MC	0.008	JQ420951	99.1	340	ericoid mycorrhizal fungus	SH265789.06FU	Sebacinales	Basidiomycota
500	MC	0.008	UDB017969	98.2	221	*Hebeloma radicosum*	SH039561.06FU	Agaricales	Basidiomycota
1088	MC	0.008	HQ211525	97.8	277	Helotiaceae	SH209578.06FU	Helotiales	Ascomycota
1257	MC	0.0456	EU292248	98.9	279	Helotiales sp.	SH275085.06FU	Helotiales	Ascomycota
357	MC	0.008	FJ475785	99.3	280	Helotiales sp.	SH195751.06FU	Helotiales	Ascomycota
934	MC	0.0238	HQ212298	97.8	276	Helotiales sp.	SH241585.06FU	Helotiales	Ascomycota
64	MC	0.0166	HQ211772	98.8	162	Hyaloscyphaceae sp.	SH195749.06FU	Helotiales	Ascomycota
125	MC	0.025	HQ212020	99.3	279	Lecanoromycetes sp.	SH198710.06FU		Ascomycota
30	MC	0.008	JN889819	98.5	201	Lecanoromycetes sp.	SH197703.06FU		Ascomycota
375	MC	0.008	EF433993	98.1	257	Leotiomycetes sp.	SH217860.06FU		Ascomycota
2446	MC	0.0466	FJ552958	97.8	268	*Leptosphaeria doliolum*	SH228249.06FU	Pleosporales	Ascomycota
1260	MC	0.0152	DQ112559	99.4	325	*Lycoperdon utriforme*	SH244710.06FU	Agaricales	Basidiomycota
3396	MC	0.0372	KC152885	100	256	*Malassezia restricta*	SH206219.06FU	Malasseziales	Basidiomycota
4316	MC	0.0304	EF434060	97.1	272	*Meliniomyces bicolor*	SH161266.06FU	Helotiales	Ascomycota
1259	MC	0.0456	JN655597	97.4	191	*Meliniomyces sp.*	SH207177.06FU	Helotiales	Ascomycota
2702	MC	0.008	GQ219843	97.6	255	*Mortierella antarctica*	SH211068.06FU	Mortierellales	Zygomycota
374	MC	0.0248	HQ211914	99.6	281	Pezizomycotina sp.	SH213006.06FU		Ascomycota
2690	MC	0.008	GU909828	100	211	*Preussia* sp.	SH190471.06FU	Pleosporales	Ascomycota
865	MC	0.0164	JQ420956	100	327	root endophyte	SH265824.06FU	Sebacinales	Basidiomycota
1232	MC	0.0456	JQ420999	99.1	339	root endophyte	SH167198.06FU	Sebacinales	Basidiomycota
1105	MC	0.008	JQ421000	97.4	342	root endophyte	SH285151.06FU	Sebacinales	Basidiomycota
1120	MC	0.008	UDB015975	100	333	*Russula renidens*	SH025103.06FU	Russulales	Basidiomycota
3392	MC	0.0456	FJ827241	97.8	321	*Sebacina* sp.	SH231852.06FU	Sebacinales	Basidiomycota
126	MC	0.0486	HQ211970	99.7	309	Sebacinaceae sp.	SH214727.06FU	Sebacinales	Basidiomycota

3483	MC	0.0452	EF433989	99.7	310	Sebacinales Group B	SH265810.06FU	Sebacinales	Basidiomycota
1231	MC	0.0142	FJ475668	99.6	282	*Sporormiella* sp.	SH190484.06FU	Pleosporales	Ascomycota
2036	MC	0.0162	GU817126	99.6	279	*Tetracladium furcatum*	SH216427.06FU	Helotiales	Ascomycota
3158	MC	0.0456	AJ893339	100	219	Thelephoraceae sp.	-	Thelephorales	Basidiomycota
4645	MC	0.0456	EU645643	98.9	180	Thelephoraceae sp.	SH108158.05FU	Thelephorales	Basidiomycota
3351	MC	0.0456	JN198080	97.8	324	Thelephoraceae sp.	SH202475.06FU	Thelephorales	Basidiomycota
1124	MC	0.0352	HQ433170	99.6	265	*Tomentella* sp.	-	Thelephorales	Basidiomycota
181	MC	0.008	DQ974780	98.1	268	*Tomentella* sp.	SH220174.06FU	Thelephorales	Basidiomycota
188	MC	0.041	JF304353	100	300	*Tomentella* sp.	SH202711.06FU	Thelephorales	Basidiomycota
81	MC	0.0456	HQ215815	100	300	*Tomentella* sp.	SH202533.06FU	Thelephorales	Basidiomycota
484	MC	0.0456	JX630588	99.6	284	*Tomentella* sp.	SH220001.06FU	Thelephorales	Basidiomycota
1009	MT	0.043	AY249072	98.9	275	*Cadophora melinii*	SH267533.06FU	Helotiales	Ascomycota
2178	MT	0.043	JQ312919	100	197	*Calcarisporium arbuscula*	SH205605.06FU	Hypocreales	Ascomycota
270	MT	0.008	FR773398	99.5	219	Capnodiales	SH235804.06FU	Capnodiales	Ascomycota
3674	MT	0.008	EU035413	99.6	262	*Cladophialophora* sp.	SH228303.06FU	Chaetothyriales	Ascomycota
3749	MT	0.0142	HQ211817	98.9	264	*Cryptosporiopsis brunnea*	SH108598.06FU	Helotiales	Ascomycota
2925	MT	0.008	JN032540	98.8	259	Cystofilobasidiales sp.	SH198310.06FU	Cystofilobasidiales	Basidiomycota
1323	MT	0.0212	FJ213516	100	281	*Davidiella tassiana*	SH093668.06FU	Capnodiales	Ascomycota
3375	MT	0.0166	AM260897	99.2	266	Dothideomycetes sp.	SH196053.06FU		Ascomycota
3458	MT	0.0228	FN298754	97.3	258	ectomycorrhizal fungus	SH236313.06FU	Chaetothyriales	Ascomycota
2099	MT	0.043	HQ211764	97.8	185	ectomycorrhizal fungus	SH207207.06FU	Helotiales	Ascomycota
2415	MT	0.016	FJ896135	98.5	333	*Exobasidium arescens*	SH236085.06FU	Exobasidiales	Basidiomycota
211	MT	0.036	HQ211632	99.4	329	*Exobasidium woronichinii*	SH204830.06FU	Exobasidiales	Basidiomycota
337	MT	0.0396	HQ211516	98.6	277	Helotiales sp.	SH215692.06FU	Helotiales	Ascomycota

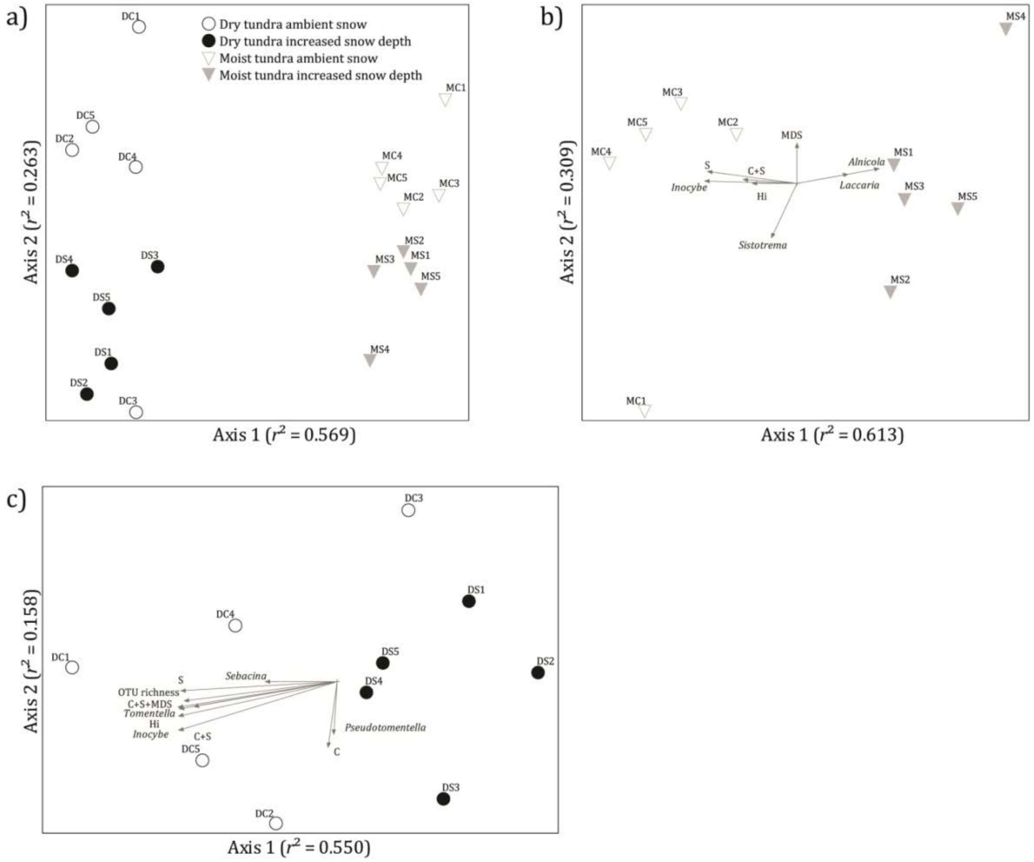
5447	MT	0.018	HQ211644	97.8	277	Hyaloscyphaceae sp.	SH189791.06FU	Helotiales	Ascomycota
1060	MT	0.043	HE605234	99.7	293	*Isaria* sp.	SH196291.06FU	Hypocreales	Ascomycota
1174	MT	0.008	HQ211903	99.6	256	*Lachnum* sp.	SH189825.06FU	Helotiales	Ascomycota
2592	MT	0.018	HQ212064	98.7	229	*Lachnum* sp.	SH189775.06FU	Helotiales	Ascomycota
5657	MT	0.0426	JQ347180	97.1	210	*Lachnum* sp.	SH189775.06FU	Helotiales	Ascomycota
1073	MT	0.008	FJ490755	99.3	293	*Lecanicillium* sp.	SH196376.06FU	Hypocreales	Ascomycota
88	MT	0.0258	JQ346845	99.3	281	*Leptodontidium* sp.	SH236035.06FU		Ascomycota
2082	MT	0.0444	HQ211729	97.4	191	*Meliniomyces bicolor*	SH207165.06FU	Helotiales	Ascomycota
2438	MT	0.043	AJ608979	98.2	283	*Mortierella hyalina*	SH214833.06FU	Mortierellales	Zygomycota
3537	MT	0.008	AB521986	99.1	234	*Mortierella* sp.	SH233133.06FU	Mortierellales	Zygomycota
1191	MT	0.0148	HM136654	100	240	*Mortierella* sp.	SH218432.06FU	Mortierellales	Zygomycota
378	MT	0.008	JQ272348	99.2	257	*Mortierella* sp.	SH233132.06FU	Mortierellales	Zygomycota
785	MT	0.043	KC773828	99.3	297	*Penicillium angulare*	SH213212.06FU	Eurotiales	Ascomycota
768	MT	0.008	HQ211540	99.6	282	Pezizomycotina sp.	-		Ascomycota
890	MT	0.0432	HM044625	98.9	278	*Phacidium lacerum*	SH108595.06FU	Helotiales	Ascomycota
247	MT	0.008	HF947841	99.1	211	*Phialocephala fortinii*	SH113844.06FU	Helotiales	Ascomycota
3435	MT	0.0386	AB378555	99.5	222	*Pochonia bulbillosa*	SH293054.06FU	Hypocreales	Ascomycota
1778	MT	0.0456	FJ948141	99.6	277	*Pseudocercosporella* sp.	SH195092.06FU	Capnodiales	Ascomycota
2153	MT	0.0212	JQ666376	97.1	174	*Pseudogymnoascus roseus*	SH236509.06FU	*Incertae sedis*	Ascomycota
1275	MT	0.015	HQ115661	97.1	279	*Pseudogymnoascus roseus*	SH236509.06FU	*Incertae sedis*	Ascomycota
46	MT	0.0222	JX131373	98.2	169	*Pseudogymnoascus roseus*	SH236509.06FU	*Incertae sedis*	Ascomycota
161	MT	0.0236	HQ211674	97.1	174	*Pseudogymnoascus roseus*	SH236509.06FU	*Incertae sedis*	Ascomycota
6044	MT	0.008	EU019299	97.1	276	*Trimmatostroma betulinum*	SH193248.06FU	Helotiales	Ascomycota
1322	MT	0.0284	JF440625	99.7	329	*Umbelopsis isabellina*	SH056344.06FU	Mucorales	Zygomycota
6121	MT	0.0364	HQ211801	98.8	347	*Umbelopsis* sp.	SH205590.06FU	Mucorales	Zygomycota

328	MT	0.0212	EF434088	98.8	327	*Umbelopsis* sp.	SH205589.06FU	Mucorales	Zygomycota
1219	MT	0.043	FJ386891	99.3	293	unidentified fungus	-		
3683	MT	0.0168	JQ666464	98.3	292	unidentified fungus	SH195737.06FU		
1227	DC	0.0214	HQ212085	99.2	258	*Archaeorhizomyces* sp.	SH198360.06FU	Archaeorhizomycetales	Ascomycota
3372	DC	0.035	FJ475667	99.6	262	Dothideomycetes sp.	SH207413.06FU		Ascomycota
2436	DC	0.0422	HQ211576	99.3	293	Dothideomycetes sp.	SH231472.06FU		Ascomycota
1294	DC	0.0442	HQ625478	99.1	319	ectomycorrhizal fungus	SH220993.06FU	Agaricales	Basidiomycota
572	DC	0.0342	DQ497936	99.3	296	ectomycorrhizal fungus	SH305874.06FU	Chaetothyriales	Ascomycota
1253	DC	0.0422	UDB014235	99.7	326	*Entoloma cetratum*	SH203333.06FU	Agaricales	Basidiomycota
1281	DC	0.0136	FM202814	97.9	242	*Tomentella* sp.	SH112690.05FU	Thelephorales	Basidiomycota
4022	DC	0.0442	JF519380	96.8	277	*Trechispora* sp.	SH203290.06FU	Trechisporales	Basidiomycota
1301	DT	0.0068	JQ759462	99.6	285	Amphisphaeriaceae sp.	SH210430.06FU	Xylariales	Ascomycota
846	DT	0.021	JX984742	99.7	290	*Aureobasidium pullulans*	SH053566.06FU	Dothideales	Ascomycota
3497	DT	0.0068	FJ554074	98.1	267	*Bullera* sp.	SH237040.06FU	Tremellales	Basidiomycota
1093	DT	0.026	HQ260104	97.3	291	*Capronia* sp.	SH227237.06FU	Chaetothyriales	Ascomycota
1323	DT	0.0068	FJ213516	100	281	*Davidiella tassiana*	SH093668.06FU	Capnodiales	Ascomycota
3194	DT	0.0068	EU725679	97.3	257	*Davidiella tassiana*	SH253764.06FU	Capnodiales	Ascomycota
602	DT	0.0068	GU083075	97.8	277	ectomycorrhizal fungus	SH209187.06FU	Helotiales	Ascomycota
1335	DT	0.041	GU083029	98.3	179	ectomycorrhizal fungus	SH108616.06FU	Helotiales	Ascomycota
4782	DT	0.0436	GU083075	97.1	170	ectomycorrhizal fungus	SH209187.06FU	Helotiales	Ascomycota
211	DT	0.0412	HQ211632	99.4	329	*Exobasidium woronichinii*	SH204830.06FU	Exobasidiales	Basidiomycota
3586	DT	0.0476	FN392312	100	199	fungal endophyte	SH232493.06FU	Helotiales	Ascomycota
248	DT	0.0154	HQ211781	99.6	263	fungal endophyte	SH207406.06FU	Venturiales	Ascomycota
1073	DT	0.0264	FJ490755	99.3	293	*Lecanicillium* sp.	SH196376.06FU	Hypocreales	Ascomycota

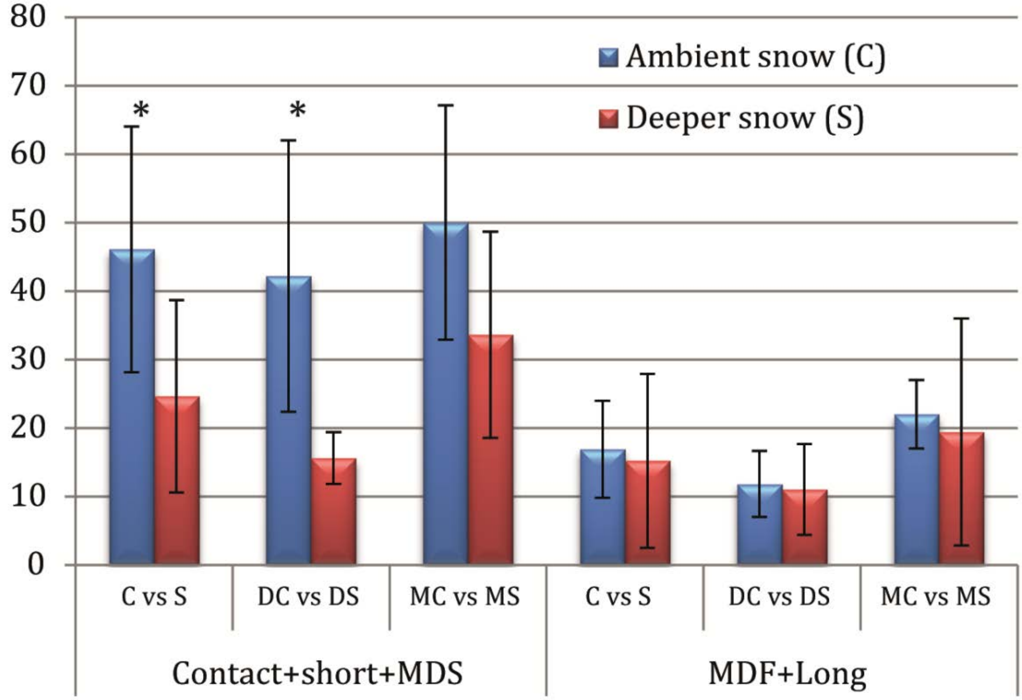
5392	DT	0.027	HQ446010	97.5	279	Lecanoromycetes sp.	SH198715.06FU		Ascomycota
3702	DT	0.027	HQ021932	98.5	267	*Meliniomyces bicolor*	SH207295.06FU	Helotiales	Ascomycota
6621	DT	0.0412	JQ346979	97.8	185	*Meliniomyces* sp.	SH207172.06FU	Helotiales	Ascomycota
2702	DT	0.0068	GQ219843	97.6	255	*Mortierella antarctica*	SH211068.06FU	Mortierellales	Zygomycota
3460	DT	0.0476	HM044656	97.7	353	*Mortierella* sp.	SH217238.06FU	Mortierellales	Zygomycota
1239	DT	0.0068	JX984721	97.5	201	*Pseudogymnoascus roseus*	SH321318.06FU	*Incertae sedis*	Ascomycota
2153	DT	0.0462	JQ666376	97.1	174	*Pseudogymnoascus roseus*	SH236509.06FU	*Incertae sedis*	Ascomycota
1868	DT	0.02	FJ235993	99.6	244	*Rhodotorula* sp.	SH227569.06FU	Sporidiobolales	Basidiomycota
132	DT	0.0352	GQ924001	98.5	274	root endophyte	SH194401.06FU	Helotiales	Ascomycota
1212	DT	0.0372	HQ446017	99.3	285	*Trapeliopsis* sp.	SH223082.06FU	Agyriales	Ascomycota
1911	DT	0.0458	JX984720	100	234	Tremellomycetes sp.	SH230598.06FU		Basidiomycota
4883	DT	0.037	GU307354	98.2	170	unidentified fungus	SH106459.05FU		
2409	DT	0.0154	KC588625	99.4	176	unidentified fungus	-		
5197	DT	0.02	EU035446	97.8	275	*Venturia alpina*	SH238439.06FU	Pleosporales	Ascomycota



S4.1. Total ECM fungal sequence counts, classified by taxonomic and functional traits, comparing ambient snow with increased snow depth plots. The legend for each pair of graphics is organized by colors disposed in clockwise. Abbreviations are C: contact, S: short-distance, MDS: medium-distance smooth, MDF: medium-distance fringe, L: long-distance



S4.2. Non-metric multidimensional scaling (NMDS) ordination plots of basidiomycete ECM fungal communities from the ambient and increased snow depth plots based on OTU presence-absence primary matrix, and taxonomic and extramatrical mycelium groups in: a) the whole community (dry and moist tundra) with final stress and instability of 0.1207 < 0.00001, respectively, axis 1: r2 = 0.569, axis 2: r2 = 0.263, total r2 = 0.832, orthogonality = 98.2%. MRPP analysis: p = 0.0000027, A= 0.1202. b) The moist tundra with a final stress and instability of 0.0621 and < 0.00001, respectively, axis 1: r2 = 0.613, axis 2: r2 = 0.309, total r2 = 0.922, orthogonality = 95.4%. MRPP analysis: p = 0.0017, A = 0.1254. c) The dry tundra, final stress and instability of 0.1239 and < 0.00001, respectively, axis 1: r2 = 0.550, axis 2: r2 = 0.158, total r2 = 0.708, orthogonality = 96.3%. MRPP analysis: p = 0.0191, A= 0.04425. Vectors with |r|≥ 0.5 are represented on the ordination plot. Abbreviations are C= contact hyphal exploration type (ET), S = short-distance ET, MDS = medium-distance ET, Hi: hydrophilic hyphae.



S4.3. Average OTU richness per ECM fungi hyphal exploration groups in dry and moist tundra types of the communities with ambient (left) and increased snow depth (right). Abbreviations are C: ambient snow, S: increased snow depth, DC: dry tundra ambient snow, DS: dry tundra increased snow depth, MC: moist tundra ambient snow, MS: moist tundra increased snow depth, MDS: medium-distance smooth, MDF: medium-distance fringe. *Significant treatment effect (α = 0.05).

S4.4. Indicator OTUs (resultant from indicator species analysis, α = 0.05) per treatment (correlated site), with classification, similarity and origin of the reference sequence. Legend – Dry heath tundra with ambient snow, MC: Moist acidic tussock tundra with ambient snow, MS: Moist acidic tundra with increased snow depth.

OTU	Correlated site	Kõljalg *et al.* (2013) and UNITE classification	Similarity (%)	Best match sequence origin
473	DC	*Tomentella* sp. (JX630707)	97.4	Happy Valley, AK
6290	DC	*Tomentella* sp. (UDB018363)	92.4	North India
6579	DC	*Tomentella* sp. (JX630707)	95.3	Happy Valley, AK
6686	DC	*Tomentella* sp. (FJ581421)	95.6	China: southwestern alpine meadow
8011	DC	SH108139.05FU *Tomentella* sp. (HQ211689)	93.8	Toolik Lake, AK
6073	MC	SH106684.05FU *Tomentella* sp. (EF218830)	96.5	British Columbia Interior Cedar Hemlock Forest, Canada
1991	MC	*Tomentella* sp. (JQ347212)	97.8	Subalpine medow, China
55	MC	*Tomentella* sp. (JX630431)	97.5	Thule, Greenland
12782	MC	*Tomentella* sp. 33E (FN687652)	95.2	Mid alpine environment, Sweden
1354	MC	*Tomentella* sp. (JX630589)	100	Prince Patrick Island, Canada
12656	MC	SH103086.05FU *Tomentella badia* (JQ711987)	93.6	BC, Canada
251	MC	SH108158.05FU *Tomentella* sp. (JF304372)	97.6	North America Arctic Transect
390	MC	SH166458.05FU *Cortinarius huronensis* (UDB015917)	100	Kilingi-Nõmme, Estonia
80	MC	SH105172.05FU *Cortinarius* cf. *flos-paludis* (FJ039560)	98.1	Canada
1030	MC	SH099601.05FU *Inocybe leiocephala* (AM882793)	99.2	Sweden
872	MC	SH111588.05FU *Inocybe nitidiuscula* (HQ604382)	95.4	BC, Canada?
301	MC	SH102330.05FU *Russula renidens* (UDB011117)	99.1	Kilpisjärvi, Finland
828	MC	SH164699.05FU *Lactarius torminosus* (UDB011509)	99.4	Estonia
10373	MS	*Laccaria* sp. (JX630414)	97.9	Ellef Ringnes Island, Canada
328	MS	*Inocybe* sp. (JX630878)	96.8	Baffin Island, Canada

3465	MS	SH105206.05FU *Cortinarius* sp. 17C (FN687635)	94.3	Sweden
11539	MS	SH101144.05FU *Russula* sp. (HQ212276)	96.9	Toolik Lake, AK
1165	MS	SH101328.05FU *Alnicola* sp. (FJ197860)	98.4	Primary successional glacier foreland soil, Austria
7259	MS	SH101328.05FU *Alnicola* sp. (FJ197860)	96	Primary successional glacier foreland soil, Austria
7802	MS	SH101328.05FU *Alnicola* sp. (FJ197860)	95.9	Primary successional glacier foreland soil, Austria
1058	MS	SH112490.05FU *Tomentella lapida* (JQ724049)	99.6	Natural/naturalized willow site, Sweden

S4.5. Paired correlation of OTU richness and sequence abundance (for 5 replicates) between the genera with higher richness, and between grouped hyphal exploration types (ET). Color code: white: ambient snow plots; grey: increased snow depth plots. Legend – C: contact, S: short-distance ET, MDS: medium-distance smooth ET, MDF: medium-distance fringe ET, L: long-distance ET. In bold lettering significant effect (α = 0.05).

OTU Richness (presence-absence)

Dry heath tundra

	Cortinarius	*Tomentella*	*Inocybe*	*Russula*	C/ S/ MDS	MDF/ L
Cortinarius	-	0.62	0.63	-0.51	-	-
Tomentella	0.20	-	**0.91**	-0.74	-	-
Inocybe	0.62	0.41	-	**-0.94**	-	-
Russula	-0.24	0.10	-0.46	-	-	-
C/ S/ MDS	-	-	-	-	-	0.66
MDF/ L	-	-	-	-	0.12	-

Ambient snow

Increased snow depth

Moist acidic tussock tundra

	Cortinarius	*Tomentella*	*Inocybe*	*Russula*	C/ S/ MDS	MDF/ L
Cortinarius	-	0.69	0.65	**0.89**	-	-
Tomentella	**0.92**	-	0.40	0.50	-	-
Inocybe	0.21	0.21	-	0.44	-	-
Russula	0.80	0.81	0.37	-	-	-
C/ S/ MDS	-	-	-	-	-	**0.88**
MDF/ L	-	-	-	-	**0.92**	-

Ambient snow

Increased snow depth

Sequence abundance

Dry heath tundra

	Cortinarius	*Tomentella*	*Inocybe*	*Russula*	C/ S/ MDS	MDF/ L
Cortinarius	-	0.27	0.58	-0.07	-	-
Tomentella	-0.26	-	0.41	-0.32	-	-
Inocybe	0.60	-0.04	-	-0.84	-	-
Russula	-0.22	-0.17	0.43	-	-	-
C/ S/ MDS	-	-	-	-	-	0.75
MDF/ L	-	-	-	-	-0.41	-

Ambient snow

Increased snow depth

Moist acidic tussock tundra

	Cortinarius	*Tomentella*	*Inocybe*	*Russula*	C/ S/ MDS	MDF/ L
Cortinarius	-	0.08	0.85	0.61	-	-
Tomentella	**0.98**	-	0.29	0.61	-	-
Inocybe	0.17	0.12	-	0.65	-	-
Russula	**0.89**	**0.90**	0.38	-	-	-
C/ S/ MDS	-	-	-	-	-	0.01
MDF/ L	-	-	-	-	0.85	-

Ambient snow

Increased snow depth

Arctic Alaska ectomycorrhizal fungal diversity. From top left: *Inocybe flavella*, *Cortinarius delibutus*, *Leccinum variicolor*, *Boletus edulis*. From bottom left: *Russula* aff. *bicolor*, *Cortinarius* aff. *aurantiobasis.*