

Supplementary Materials

Appendix S1. Fungal Operational Taxonomic Units (OTUs) isolated and identified from leaves of ten grass species at Cass Mountain Research Area, Canterbury, Aotearoa New Zealand in January 2020. Identification was obtained using NCBI BLAST searches of one representative sequence for each OTU, for which identity match and query cover percentages are reported for the best matching named fungus. All sequences were deposited into GenBank (NCBI) under accession numbers MW054250-MW054450. Function was assessed using the FUNGuild database and a literature search, from which we assigned taxa as potential pathogens, saprotrophs, endophytes, unknown (for unidentified fungi), and NA (if no information on function was available on FUNGuild). * indicates a fungi taxon novel in Aotearoa New Zealand.

OTU #	# of isolates	Determined identity	Best matching named fungus	Identity match (%)	Query cover (%)	Function	Host grass species (number of isolates)
OTU1	1	<i>Pseudoseptoria</i> sp.	KF251219 <i>Pseudoseptoria obscura</i>	98.3	94.0	Probable plant pathogen	<i>Agrostis capillaris</i> (1)
OTU2	34	<i>Pyrenophora triseptata</i>	MK540016 <i>Pyrenophora triseptata</i>	100.0	99.0	Probable plant pathogen	<i>Agrostis capillaris</i> (4), <i>Anthoxanthum odoratum</i> (6), <i>Holcus lanatus</i> (13), <i>Briza minor</i> (1), <i>Anthosachne solandri</i> (6), <i>Festuca rubra</i> (3)
OTU3	33	<i>Colletotrichum graminicola</i>	MT077165 <i>Colletotrichum graminicola</i>	99.8	99.0	Probable plant pathogen	<i>Agrostis capillaris</i> (1), <i>Anthoxanthum odoratum</i> (6), <i>Festuca novae-zelandiae</i> (2), <i>Holcus lanatus</i> (4), <i>Poa colensoi</i> (3), <i>Briza minor</i> (10), <i>Anthosachne solandri</i> (2), <i>Dactylis glomerata</i> (6), <i>Festuca rubra</i> (3)
OTU4	3	<i>Dinemasporium</i> sp.	MH864432 <i>Dinemasporium americana</i>	99.0	100.0	Probable saprotroph	<i>Poa colensoi</i> (3)
OTU5	2	<i>Dinemasporium morbidum</i>	NR_137788 <i>Dinemasporium morbidum</i>	100.0	99.0	Probable saprotroph	<i>Poa colensoi</i> (1), <i>Anthosachne solandri</i> (1)
OTU6	1	<i>Anthracoystis flocculosa</i>	MK226203 <i>Anthracoystis flocculosa</i>	99.6	97.0	Probable plant pathogen	<i>Poa colensoi</i> (1)
OTU7	1	<i>Biscogniauxia</i> sp.	MH410020 <i>Biscogniauxia</i> sp.	98.1	98.0	Probable saprotroph	<i>Poa colensoi</i> (1)
OTU8	18	<i>Epicoccum</i> sp.	MN853860 <i>Epicoccum nigrum</i>	100.0	100.0	Multiple, including probable plant pathogen	<i>Anthoxanthum odoratum</i> (4), <i>Holcus lanatus</i> (4), <i>Briza minor</i> (4), <i>Anthosachne solandri</i> (2), <i>Dactylis glomerata</i> (2), <i>Phleum pratense</i> (2)
OTU9	3	<i>Cladosporium</i> sp. 1	MN202774 <i>Cladosporium asperulatum</i>	100.0	100.0	Multiple, including possible plant pathogen	<i>Agrostis capillaris</i> (1), <i>Briza minor</i> (1), <i>Festuca rubra</i> (1)
OTU10	6	<i>Pleosporales</i> sp. 1	MK785420 <i>Pleosporales</i> sp.	99.8	100.0	NA	<i>Anthoxanthum odoratum</i> (1), <i>Festuca novae-zelandiae</i> (2), <i>Briza minor</i> (1), <i>Anthosachne solandri</i> (1), <i>Dactylis glomerata</i> (1)
OTU11	3	<i>Pyrenophora</i> sp. 1	KF428285 <i>Dreschlera</i> sp.	99.7	100.0	Probable plant pathogen	<i>Anthoxanthum odoratum</i> (1), <i>Briza minor</i> (1), <i>Phleum pratense</i> (1)
OTU12	2	<i>Alternaria</i> sp. 1	MH861944 <i>Alternaria photistica</i>	99.6	100.0	Multiple, including possible plant pathogen	<i>Briza minor</i> (2)
OTU13	1	<i>Colletotrichum</i> sp.	MT434654 <i>Colletotrichum siamense</i>	100.0	100.0	Multiple, including probable plant pathogen	<i>Briza minor</i> (1)
OTU14	1	<i>Alternaria</i> sp. 2	MK386650 <i>Alternaria</i> sp.	98.7	100.0	Multiple, including possible plant pathogen	<i>Briza minor</i> (1)
OTU15	3	<i>Neosetophoma</i> sp.	MN385449 <i>Neosetophoma</i> sp.	98.0	99.0	Probable saprotroph	<i>Anthosachne solandri</i> (3)

Appendix S1. Continued.

OTU #	# of isolates	Determined identity	Best matching named fungus	Identity match (%)	Query cover (%)	Function	Host grass species (number of isolates)
OTU16	4	<i>Parastagonospora</i> sp.	MK032173 <i>Parastagonospora dactylidis</i>	95.8	100.0	NA	<i>Anthosachne solandri</i> (4)
OTU17	14	<i>Alternaria</i> sp. 3	MN326467 <i>Alternaria infectoria</i>	99.1	96.0	Multiple, including possible plant pathogen	<i>Agrostis capillaris</i> (2), <i>Anthoxanthum odoratum</i> (1), <i>Holcus lanatus</i> (2), <i>Anthosachne solandri</i> (2), <i>Dactylis glomerata</i> (1), <i>Festuca rubra</i> (2), <i>Phleum pratense</i> (4)
OTU18	18	<i>Septoriella hollandica</i>	NR_164461 <i>Septoriella hollandica</i>	99.3	99.0	NA	<i>Agrostis capillaris</i> (3), <i>Anthoxanthum odoratum</i> (3), <i>Anthosachne solandri</i> (3), <i>Dactylis glomerata</i> (2), <i>Festuca rubra</i> (4), <i>Phleum pratense</i> (2)
OTU19	17	<i>Stagonospora</i> sp.	MN341237 <i>Stagonospora trichophoricola</i>	99.8	100.0	Probable plant pathogen	<i>Agrostis capillaris</i> (1), <i>Anthoxanthum odoratum</i> (2), <i>Holcus lanatus</i> (1), <i>Poa colensoi</i> (6), <i>Festuca rubra</i> (7)
OTU20	3	<i>Fusarium</i> sp.	MT453281 <i>Fusarium tricinctum</i>	100.0	100.0	Multiple, including possible plant pathogen	<i>Anthosachne solandri</i> (2), <i>Phleum pratense</i> (1)
OTU21	6	<i>Mycosphaerella</i> sp.	MH856523 <i>Mycosphaerella calamagrostidis</i>	97.4	97.0	Probable plant pathogen	<i>Holcus lanatus</i> (3), <i>Anthosachne solandri</i> (2), <i>Phleum pratense</i> (1)
OTU22	2	<i>Rutstroemia</i> sp.	LT158452 <i>Rutstroemia maritima</i>	99.5	99.0	Probable saprotroph	<i>Agrostis capillaris</i> (2)
OTU23	3	<i>Alternaria</i> sp. 4	KR094447 <i>Alternaria infectoria</i>	99.8	99.0	Multiple, including possible plant pathogen	<i>Anthosachne solandri</i> (3)
OTU24	1	<i>Sordaria</i> sp.	MH859347 <i>Sordaria macrospora</i>	100.0	99.0	Probable saprotroph	<i>Agrostis capillaris</i> (1)
OTU25	2	<i>Penicillium</i> sp.	MN589639 <i>Penicillium crustosum</i>	100.0	100.0	Probable saprotroph	<i>Agrostis capillaris</i> (1), <i>Dactylis glomerata</i> (1)
OTU26	1	<i>Hypocreales</i> sp.	MH858530 <i>Amerosporium atrum</i>	100.0	100.0	Possible saprotroph	<i>Dactylis glomerata</i> (1)
OTU27	5	<i>Arthrinium</i> sp.	MN947641 <i>Arthrinium</i> sp.	97.2	96.0	Probable saprotroph	<i>Festuca novae-zelandiae</i> (3), <i>Festuca rubra</i> (2)
OTU28	1	Unknown fungus ²	KU163930 Uncultured fungus	99.1	100.0	Unknown	<i>Festuca rubra</i> (1)
OTU29	1	<i>Pleosporales</i> sp. 2	KT268448 <i>Pleosporales</i> sp.	96.6	100.0	NA	<i>Festuca rubra</i> (1)
OTU30	1	<i>Oculimacula</i> sp.	MG934455 <i>Oculimacula acufiformis</i> sp.	99.8	96.0	Probable plant pathogen	<i>Phleum pratense</i> (1)
OTU31	1	<i>Cladosporium</i> sp. 2	MF288739 <i>Cladosporium herbarum</i>	99.8	100.0	Multiple, including possible plant pathogen	<i>Phleum pratense</i> (1)
OTU32	1	<i>Sacchettoeciaceae</i>	MT107051 <i>Kabatiella microsticta</i>	100.0	100.0	NA	<i>Phleum pratense</i> (1)
OTU33	1	<i>Mucor hiemalis</i>	LC413619 <i>Mucor hiemalis</i>	100.0	100.0	Probable plant pathogen	<i>Phleum pratense</i> (1)
OTU34*	1	Unknown fungus aff. <i>Anthostomelloides</i> sp.	NR_153509 <i>Anthostomelloides brabeji</i>	95.3	100.0	Unknown	<i>Briza minor</i> (1)
OTU35	1	<i>Botrytis</i> sp.	MT225784 <i>Botrytis cinerea</i>	100.0	100.0	Multiple, including probable pathogen	<i>Anthoxanthum odoratum</i> (1)
OTU36	1	<i>Paraphaeosphaeria</i> sp.	MK646057 <i>Paraphaeosphaeria neglecta</i>	100.0	99.0	Probable saprotroph	<i>Anthoxanthum odoratum</i> (1)
OTU37	1	<i>Sordariomycetes</i> sp.	MH178698 <i>Sordariomycetes</i> sp.	98.4	90.0	NA	<i>Festuca novae-zelandiae</i> (1)

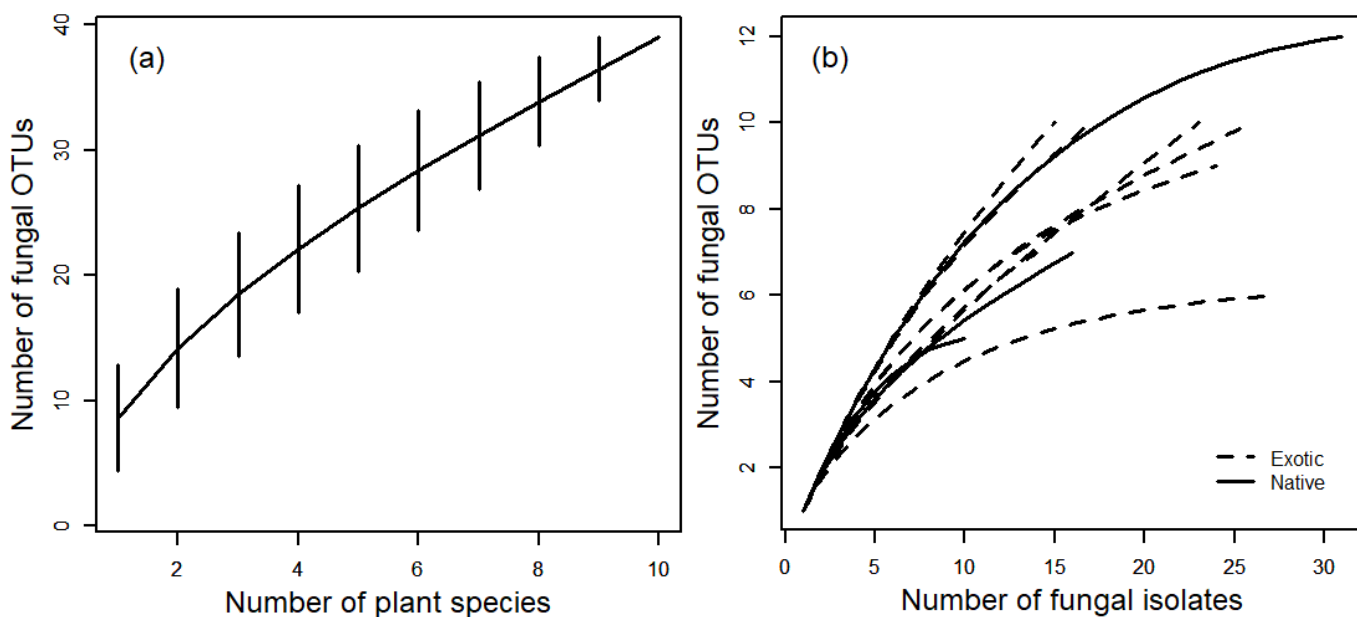
Appendix S1. Continued.

OTU #	# of isolates	Determined identity	Best matching named fungus	Identity match (%)	Query cover (%)	Function	Host grass species (number of isolates)
OTU38	2	<i>Phialocephala</i> sp.	MN006138 <i>Phialocephala bamuru</i>	98.0	100.0	Probable endophyte	<i>Festuca novae-zelandiae</i> (2)
OTU39	1	<i>Cephalosporium</i> sp.	MH859752 <i>Cephalosporium gramineum</i>	99.1	99.0	Multiple, including probable pathogen	<i>Poa colensoi</i> (1)

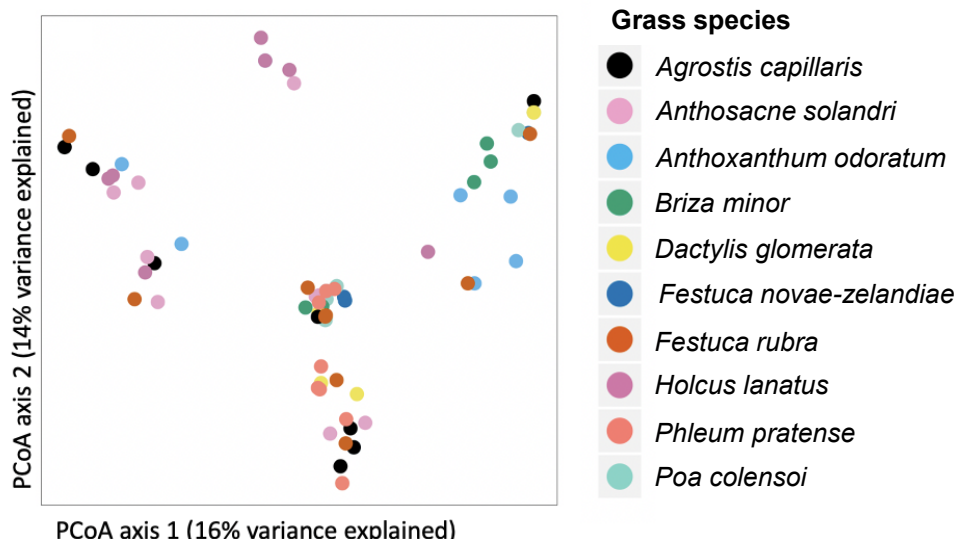
1: Preferred genus name (NZFungi2 database, Manaaki Whenua – Landcare Research)

2: No named match above 90%

Appendix S2. Taxa accumulation (a) and rarefaction curves (b) for foliar fungi cultured from ten grass species at Cass Mountain Research Area, Canterbury, Aotearoa New Zealand.



Appendix S3. Ordination showing principal coordinates analyses of Bray-Curtis dissimilarities among the foliar fungal isolated from individual grasses at Cass Mountain Research Area, Canterbury, Aotearoa New Zealand. Each point represents the cultured foliar fungal community of an individual grass, with different colours indicating the different grass species. Individual grasses closer together in ordination space hosted more similar fungal communities.



Appendix S4. Foliar fungal diversity metrics for each grass species surveyed at the Cass Mountain Research Area, Canterbury, Aotearoa New Zealand.

Grass species	Rarefied OTU richness	Effective diversity	Chao1 estimated diversity
<i>Agrostis capillaris</i>	7.15	8.59	15.00
<i>Anthoxanthum odoratum</i>	6.15	7.67	15.00
<i>Festuca novae-zelandiae</i>	5.65	6.25	20.50
<i>Holcus lanatus</i>	5.73	5.33	9.00
<i>Poa colensoi</i>	6.13	7.31	10.00
<i>Briza minor</i>	4.48	4.38	6.00
<i>Anthosachne solandri</i>	7.47	8.62	17.00
<i>Dactylis glomerata</i>	7.24	10.65	12.17
<i>Festuca rubra</i>	5.00	4.75	5.00
<i>Phleum pratense</i>	5.43	5.41	13.00