

New Phytologist Supporting Information

Article title: Root trait-microbial relationships across tundra plant species

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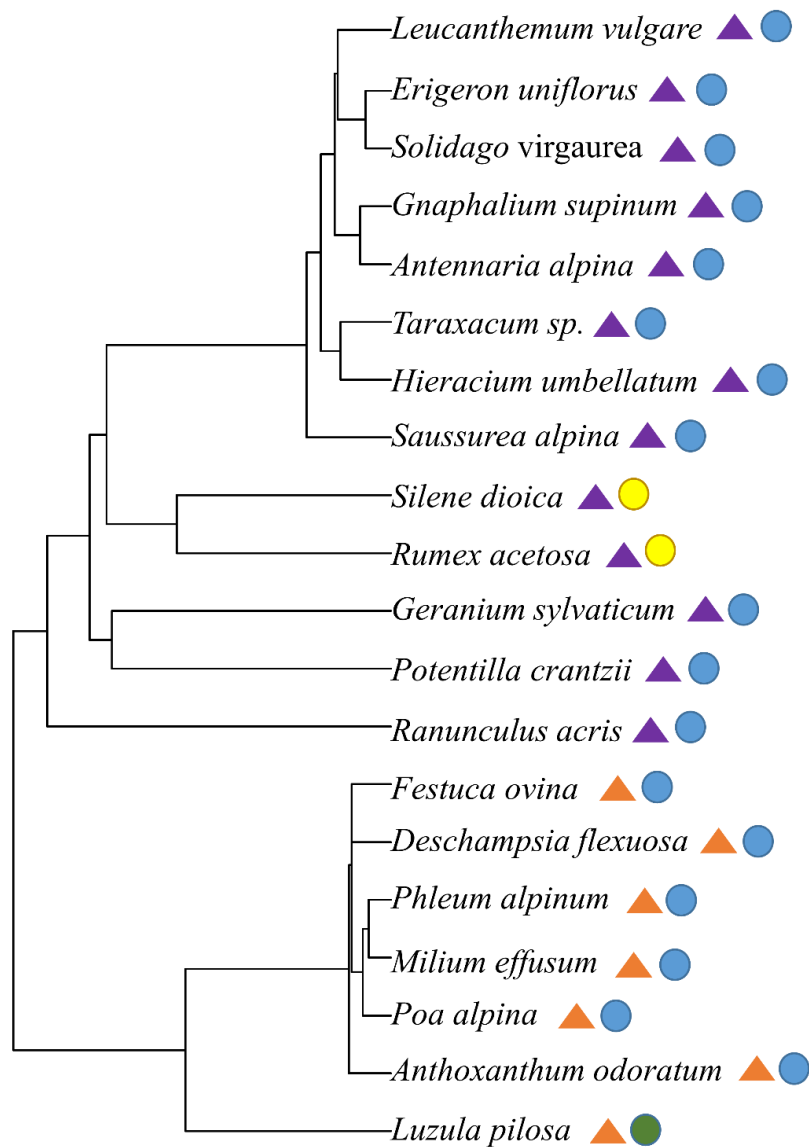


Figure S1. Phylogenetic tree with the twenty tundra plant species included in the experiment and their functional group assignment. Purple triangles represent forbs and orange triangles represent forbs. Blue circles represent species commonly found with fine roots colonized by arbuscular mycorrhizal fungi (AMF), yellow circles represent species that are facultative hosts (i.e., non-mycorrhizal or as hosts), while the green circle represents a species rarely found to host AMF. All mycorrhizal classification types are based on Soudzilovskaia *et al.* (2020).

Table S1. Mean fine root trait values for all plant species with standard deviations in parentheses. The eleven root traits are root phenol to nitrogen ratio (PhN), root carbon to nitrogen ratio (CNRatio), root nitrogen content (RNC), root carbon content (RCC), root phenol content (TRPC), root forks per root length (RFRL), specific root area (SRA), root dry matter content (RDMC), specific root length (SRL), specific root tip abundance (SRTA) and average diameter (AD).

Plant species	AD	SRTA	SRL	RDMC	SRA	RFRL	TRPC	RCC	RNC	CNRatio	PhN
	(mm)	(tips mg ⁻¹)	(cm mg ⁻¹)	(mg mg ⁻¹)	(cm ² mg ⁻¹)	(forks cm ⁻¹)	(µg g ⁻¹)	(%)	(%)	-	(µg g ⁻¹)
<i>Antennaria alpina</i>	0.32 (0.03)	185.56 (86.33)	16.88 (3.53)	0.10 (0.01)	1.66 (0.23)	9.67 (3.43)	2.43 (0.53)	47.66 (1.30)	2.92 (0.13)	16.37 (0.95)	0.83 (0.18)
<i>Anthoxanthum odoratum</i>	0.24 (0.02)	295.44 (57.13)	26.09 (4.63)	0.13 (0.03)	1.94 (0.31)	18.41 (2.61)	1.14 (0.14)	48.10 (0.59)	1.26 (0.32)	40.16 (9.24)	0.94 (0.20)
<i>Deschampsia flexuosa</i>	0.27 (0.03)	202.33 (131.95)	19.66 (5.78)	0.13 (0.02)	1.63 (0.37)	11.97 (3.63)	1.32 (0.32)	48.60 (0.71)	1.47 (0.12)	33.27 (3.09)	0.89 (0.17)
<i>Erigeron uniflorus</i>	0.37 (0.02)	107.45 (53.53)	8.73 (2.49)	0.57 (0.98)	0.99 (0.23)	12.00 (3.28)	1.56 (0.25)	48.27 (0.34)	2.71 (0.21)	17.88 (1.40)	0.58 (0.13)
<i>Festuca ovina</i>	0.25 (0.02)	231.86 (99.03)	28.95 (10.60)	0.12 (0.04)	2.29 (0.88)	9.75 (2.45)	1.49 (0.22)	48.56 (1.46)	1.46 (0.28)	34.34 (6.59)	1.05 (0.24)
<i>Geranium sylvaticum</i>	0.36 (0.06)	68.48 (24.64)	7.25 (2.85)	0.20 (0.04)	0.79 (0.26)	10.31 (2.91)	1.44 (0.42)	46.97 (1.27)	1.93 (0.65)	26.21 (6.65)	0.76 (0.12)
<i>Gnaphalium supinum</i>	0.29 (0.003)	259.23 (28.69)	21.41 (5.85)	0.10 (0.01)	1.96 (0.56)	10.83 (3.11)	1.68 (0.47)	46.31 (0.29)	2.81 (0.13)	16.49 (0.64)	0.60 (0.19)
<i>Hieracium umbellatum</i>	0.36 (0.03)	96.72 (51.68)	7.44 (2.73)	0.16 (0.03)	0.82 (0.26)	15.22 (7.05)	1.45 (0.22)	47.74 (0.88)	1.95 (0.31)	24.96 (3.69)	0.75 (0.12)
<i>Leucanthemum vulgare</i>	0.33 (0.03)	107.14 (45.06)	10.27 (2.20)	0.15 (0.02)	1.06 (0.19)	11.56 (4.86)	1.60 (0.21)	47.90 (0.73)	1.65 (0.08)	29.16 (1.29)	0.97 (0.14)

<i>Luzula pilosa</i>	0.21 (0.02)	792.24 (190.27)	56.56 (9.22)	0.12 (0.04)	3.79 (0.82)	16.80 (1.76)	1.85 (0.63)	46.45 (1.32)	1.25 (0.16)	37.66 (5.39)	1.45 (0.31)
<i>Millium effusum</i>	0.24 (0.05)	442.14 (230.54)	25.25 (8.45)	0.15 (0.04)	1.81 (0.40)	23.65 (3.80)	1.22 (0.44)	45.22 (1.87)	1.51 (0.18)	30.46 (4.88)	0.81 (0.29)
<i>Phleum alpinum</i>	0.25 (0.02)	199.02 (73.91)	24.81 (5.56)	0.14 (0.01)	1.88 (0.30)	14.78 (2.41)	1.41 (0.24)	48.29 (0.48)	1.51 (0.18)	32.35 (4.05)	0.94 (0.18)
<i>Poa alpina</i>	0.26 (0.05)	225.64 (111.92)	29.22 (13.04)	0.13 (0.03)	2.25 (0.67)	13.12 (2.66)	1.18 (0.27)	48.87 (0.38)	1.69 (0.13)	29.12 (2.16)	0.71 (0.22)
<i>Potentilla crantzii</i>	0.30 (0.01)	101.92 (21.51)	14.34 (1.64)	0.14 (0.01)	1.33 (0.14)	9.56 (1.77)	1.73 (0.45)	49.11 (1.46)	2.44 (0.19)	20.20 (1.56)	0.71 (0.19)
<i>Ranunculus acris</i>	0.33 (0.01)	62.04 (15.46)	10.85 (4.24)	0.31 (0.47)	1.12 (0.16)	8.17 (1.92)	1.46 (0.10)	47.37 (0.68)	2.23 (0.30)	21.62 (3.08)	0.67 (0.13)
<i>Rumex acetosa</i>	0.31 (0.03)	143.94 (73.23)	10.72 (4.24)	0.23 (0.06)	1.01 (0.34)	19.25 (3.70)	1.20 (0.16)	47.96 (0.68)	1.65 (0.28)	30.00 (6.15)	0.74 (0.15)
<i>Saussurea alpina</i>	0.41 (0.05)	34.23 (14.97)	6.17 (0.94)	0.16 (0.01)	0.78 (0.06)	4.17 (1.89)	1.32 (0.21)	48.02 (0.47)	2.07 (0.24)	23.42 (2.67)	0.64 (0.06)
<i>Silene dioica</i>	0.35 (0.03)	87.83 (21.58)	6.75 (1.19)	0.19 (0.02)	0.73 (0.07)	14.57 (3.13)	1.05 (0.16)	46.06 (0.54)	1.32 (0.06)	35.00 (1.75)	0.80 (0.14)
<i>Solidago virgaurea</i>	0.36 (0.05)	50.24 (15.82)	8.58 (2.77)	0.16 (0.02)	0.93 (0.20)	7.02 (0.63)	1.35 (0.22)	48.02 (0.70)	1.64 (0.12)	29.41 (1.78)	0.82 (0.13)
<i>Taraxacum sp.</i>	0.33 (0.02)	72.62 (22.18)	11.75 (3.33)	0.14 (0.03)	1.20 (0.26)	4.37 (0.90)	1.65 (0.26)	48.54 (0.57)	2.09 (0.31)	23.60 (3.37)	0.80 (0.17)

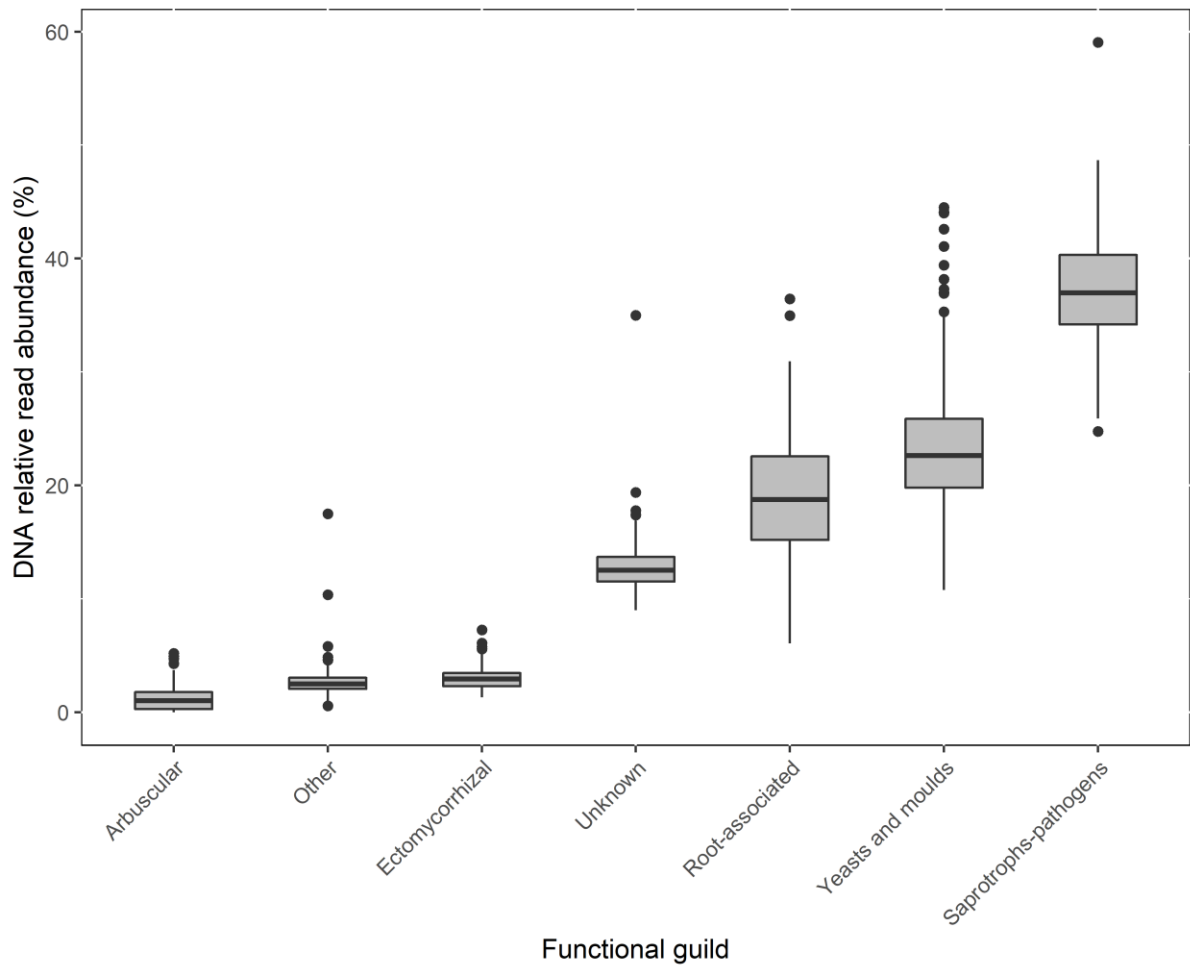


Fig. S2. Boxplot showing fungal functional guild DNA relative read abundances averaged across all experimental units. The line in each box is the median value and the box displays the 25th–75th percentile; whiskers represent the 1.5 inter-quartile range of the upper and lower percentile and outliers are shown as black circles.

Table S2. Summary statistics of generalized linear mixed effects models with relative abundances of fungal functional guilds as explained by the root economics spectrum across experimental units. Axis scores from the first two axes from the Principal Component Analysis (PCA) were used as the root economics spectrum.

Fungal functional group	PCA axis	Coefficient	Standard Error	Df	t-value	p-value
Arbuscular	(Intercept)	-4.378	0.093	102	-47.0	<0.0001
	PCA-axis 1	-0.055	0.040	102	-1.4	0.179
	PCA-axis 2	-0.079	0.052	102	-1.5	0.140
Ectomycorrhizal	(Intercept)	-3.459	0.033	102	-104.2	<0.0001
	PCA-axis 1	- 0.009	0.015	102	-0.6	0.547
	PCA-axis 2	- 0.004	0.021	102	-0.2	0.850
Saprotrophs-pathogens	(Intercept)	-0.534	0.027	102	-20.0	<0.0001
	PCA-axis 1	-0.010	0.009	102	-1. 1	0.287
	PCA-axis 2	0.00005	0.013	102	0.004	0.996
Yeasts and moulds	(Intercept)	-1.149	0.052	102	-22.1	<0.0001
	PCA-axis 1	0.010	0.015	102	0.7	0.502
	PCA-axis 2	-0.006	0.020	102	-0.3	0.779
Root-associated	(Intercept)	-1.461	0.059	102	-24.8	<0.0001
	PCA-axis 1	-0.010	0.018	102	-0.6	0.564
	PCA-axis 2	-0.0004	0.025	102	-0.02	0.984

Reference(s)

Soudzilovskaia NA, Vaessen S, Barcelo M, He J, Rahimlou S, Abarenkov K, Brundrett MC, Gomes SIF, Merckx V, Tedersoo L. 2020. FungalRoot: global online database of plant mycorrhizal associations. *New Phytologist* **227**: 955–966.