

Supplementary material

Potential effect of melanised endophytic fungi on levels of organic carbon within an Alfisol

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Table S1. Mean (\pm s.e.) weights of soil fractions obtained from wet-sieving of soil from the fungal chamber after 14 weeks of plant growth ($n = 7$)

Trifolium subterraneum inoculated with one of 24 melanised root-associated fungi was grown in an adjacent chamber. Within columns, values with different letters differ significantly ($P < 0.05$). Soil $T = 0$, unplanted soil

Inoculant	Soil weight (g)				
	<53 μm fraction	53–250 μm fraction	250–710 μm fraction	710–2000 μm fraction	>2000 μm fraction
9A	7.21 \pm 0.35b	7.51 \pm 0.15b	9.8 \pm 0.2a	9.84 \pm 0.21a	15.65 \pm 0.17c
12A	7.5 \pm 0.4b	7.76 \pm 0.14b	9.9 \pm 0.2a	9.78 \pm 0.14a	15.13 \pm 0.14b
15A	7.82 \pm 0.23b	7.28 \pm 0.11b	9.48 \pm 0.23a	9.94 \pm 0.21a	15.49 \pm 0.19c
23A	7.22 \pm 0.33b	8.33 \pm 0.13c	9.51 \pm 0.32a	9.68 \pm 0.21a	15.26 \pm 0.11b
48B	6.38 \pm 0.35b	8.68 \pm 0.18c	9.5 \pm 0.3a	9.9 \pm 0.2a	15.53 \pm 0.19c
49A	6.09 \pm 0.21b	8.79 \pm 0.14c	9.8 \pm 0.1a	10.1 \pm 0.1a	15.15 \pm 0.05b
58A	6.41 \pm 0.18b	8.16 \pm 0.13c	9.93 \pm 0.18a	10.29 \pm 0.14a	15.2 \pm 0.1b
99A	5.63 \pm 0.43b	8.77 \pm 0.31c	10.2 \pm 0.1a	9.89 \pm 0.15a	15.53 \pm 0.16c
107A	6.5 \pm 0.3b	8.38 \pm 0.28c	9.62 \pm 0.13a	10.36 \pm 0.08a	15.1 \pm 0.1b
128B	6.65 \pm 0.35b	7.98 \pm 0.09c	9.98 \pm 0.22a	10.13 \pm 0.17a	15.25 \pm 0.11b
144B	6.44 \pm 0.35b	8.05 \pm 0.14c	10.09 \pm 0.19a	10.18 \pm 0.18a	15.25 \pm 0.13b
147A	6.25 \pm 0.24b	8.2 \pm 0.2c	10.15 \pm 0.13a	10.15 \pm 0.17a	15.26 \pm 0.11b
162B	6.59 \pm 0.31b	7.9 \pm 0.2c	10.14 \pm 0.06a	10.11 \pm 0.16a	15.26 \pm 0.13b
171A	6.91 \pm 0.29b	7.91 \pm 0.15c	9.83 \pm 0.24a	10.26 \pm 0.12a	15.09 \pm 0.11b
180A	7.13 \pm 0.33b	8.2 \pm 0.1c	9.78 \pm 0.22a	9.83 \pm 0.12a	15.06 \pm 0.14b
222A	5.39 \pm 0.06b	8.5 \pm 0.1c	10.1 \pm 0.2a	10.24 \pm 0.13a	15.76 \pm 0.13c
260A	7.29 \pm 0.29b	7.92 \pm 0.14c	9.63 \pm 0.23a	9.91 \pm 0.14a	15.24 \pm 0.12b
274A	6.78 \pm 0.27b	8.65 \pm 0.12c	9.99 \pm 0.13a	10.3 \pm 0.1a	15.3 \pm 0.1b
280A	8.0 \pm 0.4b	8.07 \pm 0.18c	9.12 \pm 0.23a	9.78 \pm 0.15a	15.03 \pm 0.12b
325A	7.61 \pm 0.24b	7.91 \pm 0.24c	9.3 \pm 0.3a	10.21 \pm 0.16a	14.97 \pm 0.06b
347A	6.68 \pm 0.51b	7.91 \pm 0.19c	9.94 \pm 0.22a	10.18 \pm 0.11a	15.29 \pm 0.16b
367A	6.58 \pm 0.46b	7.79 \pm 0.12b	10.1 \pm 0.3a	10.27 \pm 0.07a	15.3 \pm 0.1b
384A	7.31 \pm 0.38b	8.01 \pm 0.22c	9.2 \pm 0.3a	10.26 \pm 0.12a	15.22 \pm 0.13b
389A	6.47 \pm 0.52b	8.17 \pm 0.14c	9.83 \pm 0.32a	10.28 \pm 0.13a	15.25 \pm 0.12b
Uninoculated planted control	7.83 \pm 0.17b	7.37 \pm 0.07b	9.66 \pm 0.16a	10.1 \pm 0.1a	15.05 \pm 0.05b
Soil $T = 0$	8.47 \pm 0.06a	8.95 \pm 0.04a	10.21 \pm 0.04a	10.22 \pm 0.04a	12.2 \pm 0.1a

Table S2. Mean carbon content of soil fractions obtained from wet-sieving of soil from the fungal chamber after 14 weeks of plant growth ($n = 7$)

Trifolium subterraneum inoculated with one of 24 melanised root-associated fungi was grown in an adjacent chamber. Soil $T = 0$, unplanted soil

Inoculant	Carbon content (mg)				Total (excluding <53 μm fraction)
	53–250 μm fraction	250–710 μm fraction	710–2000 μm fraction	>2000 μm fraction	
9A	34.69	64.39	73.31	136.31	308.7
12A	34.69	58.49	67.09	142.73	303
15A	29.78	56.6	65.31	154.15	305.84
23A	33.65	57.54	67.57	153.84	312.6
48B	30.64	52.25	65.37	148.99	297.25
49A	33.67	54.91	65.78	148.36	302.72
58A	33.05	73.58	81.3	147.27	335.2
99A	32.1	52.53	63.69	146.64	294.96
107A	38.46	80.52	85.57	131.77	336.32
128B	33.04	77.09	76.48	132.24	318.85
144B	35.42	62.96	70.14	131.77	300.29
147A	38.46	79.68	82.52	169.33	369.99
162B	34.84	86.29	84.62	139.44	345.19
171A	37.34	71.86	84.85	166.05	360.1
180A	36.16	81.17	83.65	139.44	340.42
222A	37.315	83.28	85.09	143.04	348.73
260A	35.56	78.48	84.14	142.42	340.6
274A	41.87	78.62	83.17	177.94	381.6
280A	37.04	73.23	72.96	140.69	323.92
325A	34.49	72.72	79.13	176.68	363.02
347A	35.44	83.3	83.99	174.5	377.23
367A	36.30	82.81	82.78	199.85	401.74
384A	36.37	71.67	80.95	178.57	367.56
389A	37.66	77.56	84.81	179.66	379.69
Uninoculated planted control	31.84	71.19	77.31	141.32	321.66
Soil $T = 0$	39.11	66.88	66.43	100.79	273.21

Carbon content within each soil size fraction size was calculated from soil carbon percentages measured. Soil carbon content was not measured directly. Therefore, statistical analysis of soil carbon content was not performed.

Table S3. Mean phenolic content of soil fractions obtained from wet-sieving of soil from the fungal chamber after 14 weeks of plant growth

Trifolium subterraneum inoculated with one of 24 melanised root-associated fungi was grown in an adjacent chamber

Inoculant	Phenolic content (ppm)			
	53–250 μm fraction	250–710 μm fraction	710–2000 μm fraction	>2000 μm fraction
9A	76.38	112.21	127.53	403.14
12A	98.78	151.16	141.22	380.67
15A	73.96	114.42	173.15	524.8
23A	112.46	145.03	233.68	462.99
48B	110.5	188.29	251.47	529.88
49A	136.07	182.04	240.15	544.19
58A	112.85	146.27	223.51	369.6
99A	97.87	186.29	180.89	509.07
107A	98.8	156.42	185.03	484.6
128B	98.87	165.58	222.96	527.96
144B	107.79	146.31	196.68	402.91
147A	92.82	148.19	198.84	392.18
162B	109.731	143.38	204.53	320.77
171A	103.07	140.08	157.59	424.93
180A	83.89	138.49	187.95	325.3
222A	102.43	165.67	234.39	481.15
260A	114.84	183.36	265.79	516.79
274A	123.87	208.99	296.06	607.56
280A	89.42	144.92	206.55	296.24
325A	99.43	144.15	171.22	369.91
347A	96.5	115.9	213.37	394.94
367A	90.52	143.72	204.06	484.09
384A	101.97	144.44	211.97	386.44
389A	96	166.32	225.03	433.71
Uninoculated planted control	82.03	124.52	202	378.81
Soil $T = 0$	81.36	101.9	124.07	239.61

Phenolic content within each soil size fraction was calculated from soil phenolic concentrations measured. Soil phenolic content was not measured directly. Therefore, statistical analysis of soil phenolic content was not performed.

Table S4. Mean (\pm s.e.) phenolic concentration of mycelia of the 24 melanised root-associated fungi used in the present study ($n = 7$)

GA, gallic acid

Isolate	Phenolic concentration, GA equivalent (ppm)
9A	21.58 \pm 0.85
12A	25.27 \pm 1.78
15A	24.33 \pm 0.88
23A	12.61 \pm 0.58
48B	37.77 \pm 2.51
49A	20.74 \pm 1.01
58A	20.73 \pm 1.66
99A	15.06 \pm 1.74
107A	20.2 \pm 0.9
128B	25.44 \pm 1.39
144B	21.93 \pm 0.68
147A	22.24 \pm 0.88
162B	13.87 \pm 1.26
171A	23.33 \pm 0.99
180A	29.67 \pm 1.42
222A	28.4 \pm 1.5
260A	39.1 \pm 2.1
274A	49.67 \pm 1.53
280A	24.45 \pm 1.53
325A	12.12 \pm 1.11
347A	20.51 \pm 1.46
367A	18.29 \pm 0.74
384A	22.19 \pm 0.76
389A	15.95 \pm 0.72