Online Resource 1

Article: Greater fine root biomass and endomycorrhizal colonization in the topsoil of a temperate forest under throughfall exclusion, with no detectable legacy effect

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Authors: Tristan Monette, Pierrick Romain Arnault, Audrey Maheu

Institut des sciences de la forêt tempérée, Université du Québec en Outaouais, Ripon, QC, Canada

Corresponding author: Tristan Monette; mont07@uqo.ca; tristan.monette@gmail.com

Contents: map of the study area and plots (Fig. S1); location, topography, soil and stand characteristics of the plots (Table S1); fixed-effect estimates of the fine root mass density and endomycorrhizal colonization models (Tables S2, S3); soil bulk density and dark septate endophyte colonization at 0–10, 10–20 and 20–30 cm (Figs. S2, S3)

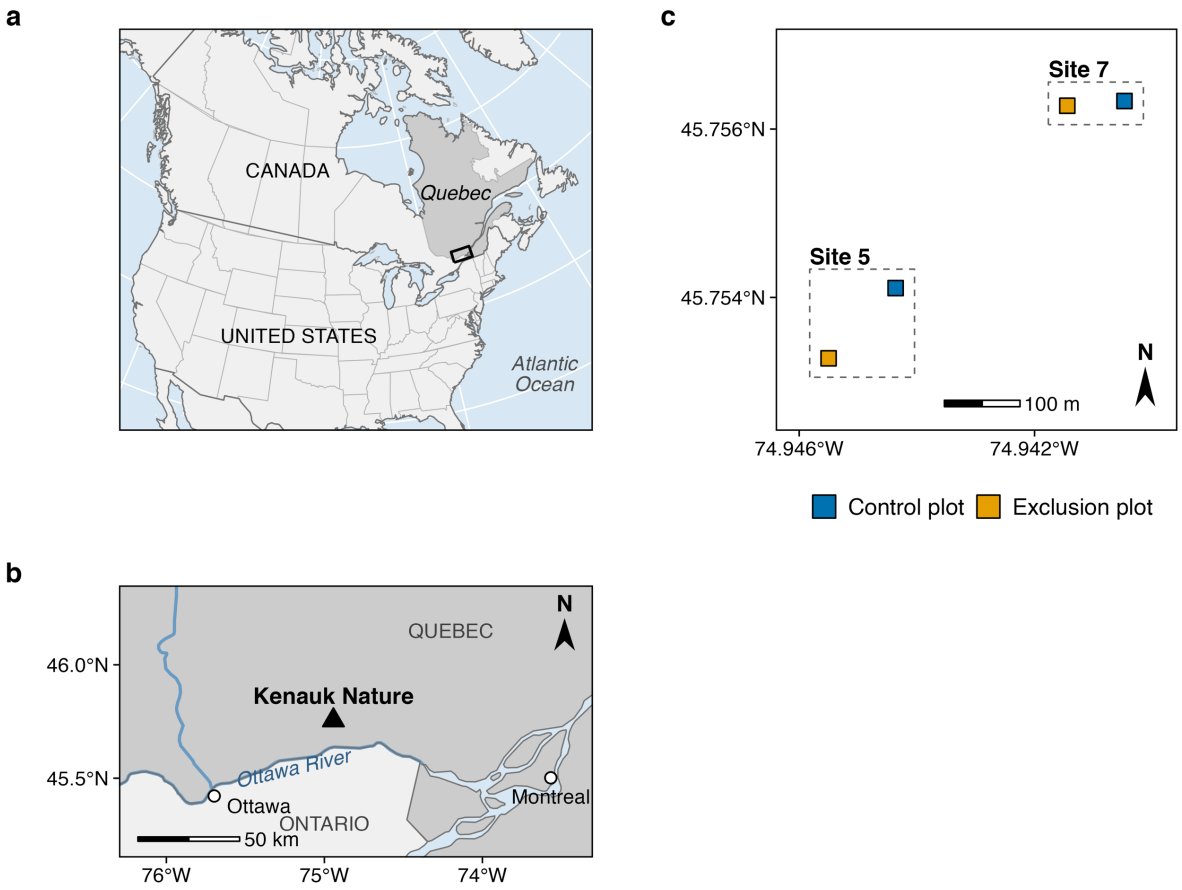


Fig. S1 Location of (a) the study region (rectangle) in North America, with the province of Quebec shaded, (b) Kenauk Nature in southwestern Quebec, Canada, between Ottawa and Montreal, and (c) the control and exclusion plots (20 × 20 m) of sites 5 and 7, drawn to scale, with a dashed outline around the two plots of each site. Map data: Natural Earth (public domain)

Table S1 Location, topography, soil and stand characteristics of the control and exclusion plots (20 × 20 m) of sites 5 and 7

	Site 5		Site 7	
Characteristic	**Control**	**Exclusion**	**Control**	**Exclusion**
Location and topography				
Latitude (°N)	45.75411	45.75328	45.75633	45.75628
Longitude (°W)	74.94436	74.94550	74.94047	74.94144
Elevation (m)[a]	256	258	271	264
Slope position[a]	Mid-slope	Mid-slope	Mid-slope	Mid-slope
Mineral soil				
Sand, 0–15 cm (%)[b]	57.5	62.7	54.4	54.3
Silt, 0–15 cm (%)[b]	38.9	34.7	43.0	43.1
Clay, 0–15 cm (%)[b]	3.6	2.6	2.6	2.6
Texture class	Sandy loam	Sandy loam	Sandy loam	Sandy loam
θ_{FC} ($m^3\ m^{-3}$)[c]	0.218	0.198	0.229	0.229
θ_{WP} ($m^3\ m^{-3}$)[c]	0.078	0.073	0.077	0.077
pH (H_2O), 0–15 cm, 2023[b]	5.18	5.15	4.79	4.35
pH (H_2O), 0–20 cm, 2025[d]	5.48	5.66	5.45	5.20
Forest floor				
pH of the FH layer (H_2O), 2023[b]	5.26	5.73	4.95	4.56
pH of the FH layer (H_2O), 2025[d]	5.67	5.56	5.39	4.90
L layer thickness, 2024 (cm)[e]	1.2 (1.8, 0.5)	2.7 (2.3, 3.0)	1.8 (2.3, 1.2)	5.6 (3.8, 7.3)
F layer thickness, 2024 (cm)[e]	2.6 (3.7, 1.5)	3.7 (4.0, 3.3)	1.8 (2.2, 1.5)	3.9 (3.2, 4.7)
Stand basal area, 2024 ($m^2\ ha^{-1}$)[f]				
Trees (DBH > 9 cm)	40.61	33.98	29.34	35.33
Acer saccharum	38.35	26.37	27.16	33.33
Tilia americana	2.05	7.60	–	–
Ostrya virginiana	0.22	–	2.18	1.99
Saplings (1 cm < DBH ≤ 9 cm)	1.65	1.59	2.05	1.73
Ostrya virginiana	0.61	0.83	1.99	1.14
Acer saccharum	0.88	0.71	0.02	0.55
Fraxinus americana	0.10	0.04	–	–
Fagus grandifolia	–	–	0.03	0.05
Acer pensylvanicum	0.05	–	0.01	–
Total	42.26	35.57	31.39	37.05
Fine root sampling points (subplots)[g]				
Total basal area ($m^2\ ha^{-1}$)	39.2, 47.1	34.5, 57.6	23.1, 34.9	28.3, 63.4
Sugar maple share of basal area (%)	99.8, 97.4	95.5, 97.3	87.2, 90.5	83.1, 96.9

[a] Elevation as reported by Parsons et al. (2025b). Slope position estimated from elevation profiles of the Canadian Digital Elevation Model (Natural Resources Canada); all plots were on relatively flat ground

[b] Composite sample of each plot, also reported by Parsons et al. (2025a). Particle-size fractions were determined by hydrometry in 2022 and pH was measured in deionized water in 2023, at a soil:water ratio of 1:2 for the mineral soil and 1:7 for the fermentation and humus (FH) layers

[c] Volumetric water content at field capacity (−33 kPa) and permanent wilting point (−1500 kPa), estimated from particle-size fractions (Section 2.2 of the article)

[d] Three samples per plot collected in 2025, the year after exclusion ended, pH measured in deionized water at a 1:2 ratio (Simoneau et al. 2026; data available at https://doi.org/10.5281/zenodo.22311230)

[e] Litter (L) and fermentation (F) layers, excluding the Ah horizon, measured at the two fine root sampling points of each plot in July 2024, the fourth year of exclusion: mean, with the two subplot values in parentheses

[f] Live stems; –, absent. American beech, *Fagus grandifolia* Ehrh.; striped maple, *Acer pensylvanicum* L.

[g] Within a 4-m radius of each fine root sampling point: values for the two subplots of each plot

Table S2 Fixed-effect estimates of the fine root mass density models in 2024, in 2025 and for the change between years (2025 − 2024). Reference levels are control (treatment), 10–20 cm (depth) and site 5. Yearly models give response ratios (RR) and the difference model gives differences in mg cm^{-3}

Fixed effect	2024 RR [95 % CI]	*p*	2025 RR [95 % CI]	*p*	2025 − 2024 difference (mg cm^{-3}) [95 % CI]	*p*
Intercept	0.89 [0.67, 1.19]	0.448	1.16 [0.89, 1.51]	0.279	0.39 [−0.46, 1.24]	0.366
Depth 0–10 cm	1.79 [1.22, 2.61]	0.003	1.57 [1.20, 2.07]	0.001	−0.15 [−1.26, 0.96]	0.792
Depth 20–30 cm	0.95 [0.65, 1.39]	0.783	0.81 [0.61, 1.06]	0.126	−0.21 [−1.32, 0.91]	0.716
Exclusion	1.13 [0.77, 1.65]	0.537	0.91 [0.65, 1.26]	0.557	−0.35 [−1.46, 0.77]	0.539
Site 7	1.94 [1.56, 2.42]	<0.001	1.26 [0.99, 1.62]	0.063	−0.77 [−1.41, −0.13]	0.019
Depth 0–10 cm × Exclusion	1.60 [0.94, 2.73]	0.086	1.36 [0.93, 2.00]	0.116	−1.02 [−2.59, 0.56]	0.207
Depth 20–30 cm × Exclusion	1.00 [0.59, 1.71]	0.999	1.12 [0.76, 1.64]	0.571	0.17 [−1.41, 1.74]	0.836

Table S3 Fixed-effect estimates of the endomycorrhizal colonization models in 2024, in 2025 and for the change between years (2025 − 2024). Reference levels are control (treatment), 10–20 cm (depth) and site 5. Yearly models give odds ratios (OR) and the difference model gives differences in colonization proportion

Fixed effect	2024 OR [95 % CI]	*p*	2025 OR [95 % CI]	*p*	2025 − 2024 difference (proportion) [95 % CI]	*p*
Intercept	0.15 [0.06, 0.37]	<0.001	0.11 [0.06, 0.20]	<0.001	−0.03 [−0.15, 0.09]	0.583
Depth 0–10 cm	0.36 [0.15, 0.87]	0.023	0.63 [0.31, 1.29]	0.209	0.04 [−0.10, 0.18]	0.597
Depth 20–30 cm	0.91 [0.45, 1.83]	0.785	1.05 [0.55, 2.00]	0.880	0.02 [−0.12, 0.16]	0.805
Exclusion	3.01 [0.99, 9.09]	0.051	0.54 [0.24, 1.23]	0.145	−0.19 [−0.34, −0.04]	0.015
Site 7	0.75 [0.28, 2.03]	0.568	1.37 [0.79, 2.36]	0.260	0.03 [−0.08, 0.13]	0.603
Depth 0–10 cm × Exclusion	2.22 [0.78, 6.32]	0.137	0.87 [0.27, 2.82]	0.816	−0.03 [−0.22, 0.17]	0.803
Depth 20–30 cm × Exclusion	0.74 [0.30, 1.83]	0.511	2.56 [0.98, 6.65]	0.054	0.14 [−0.05, 0.34]	0.155

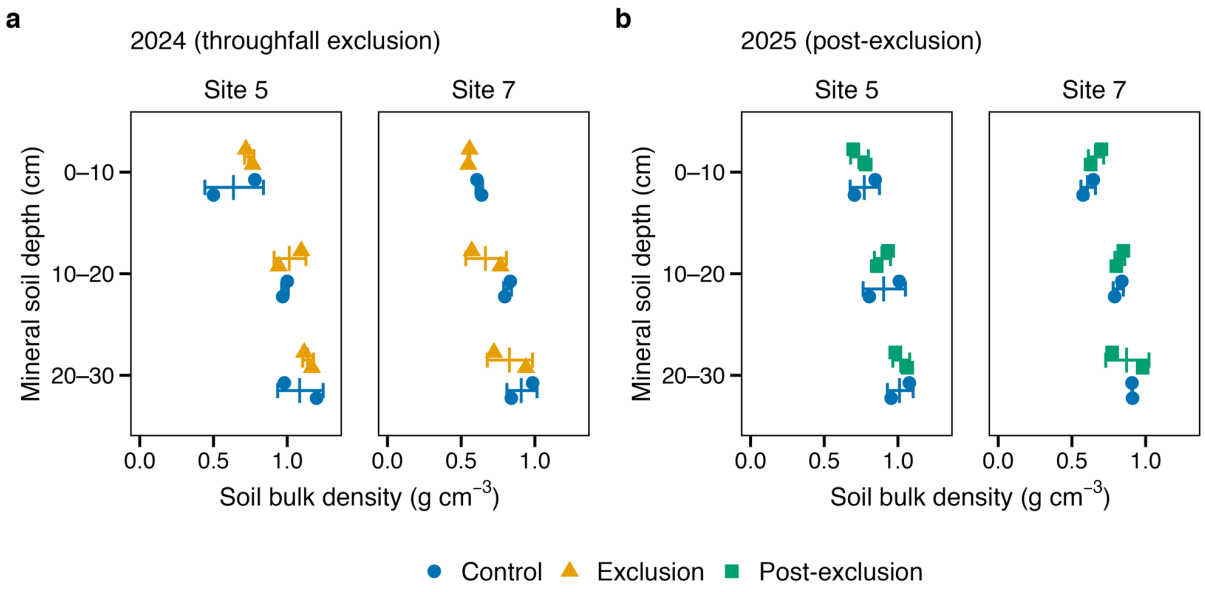


Fig. S2 Soil bulk density at 0–10, 10–20 and 20–30 cm depth in control and exclusion plots at sites 5 and 7 (a) in 2024, during throughfall exclusion, and (b) in 2025, the year after exclusion ended (post-exclusion). Each point is one subplot (two per plot and depth), slightly offset vertically so that close values remain visible, and ticks and bars show the mean ± SD of the two subplots

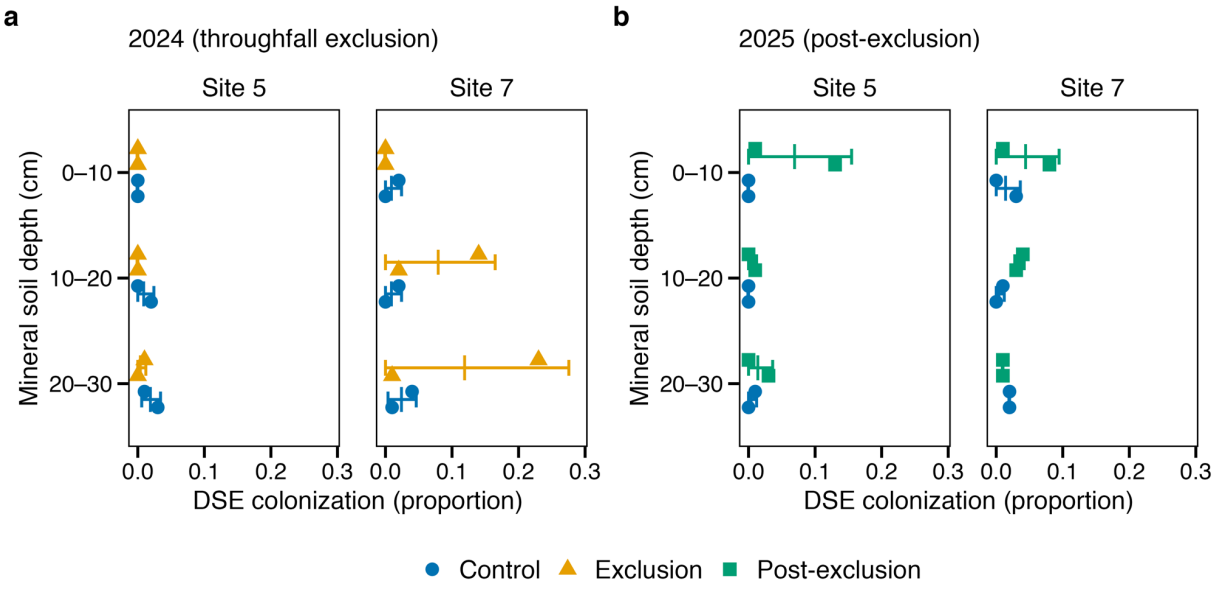


Fig. S3 Dark septate endophyte (DSE) colonization of fine roots (proportion of 100 root-gridline intersections colonized) at 0–10, 10–20 and 20–30 cm depth in control and exclusion plots at sites 5 and 7 (a) in 2024, during throughfall exclusion, and (b) in 2025, the year after exclusion ended (post-exclusion). Each point is one subplot (two per plot and depth), slightly offset vertically so that close values remain visible, and ticks and bars show the mean ± SD of the two subplots (lower bars truncated at zero)

References

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