

Supplementary Tables S1-S8

Title: Differential controls on soil carbon density and mineralization among contrasting forest types in a temperate forest ecosystem

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Table S1 Summary of *F*-values and significance level in analysis of variance (ANOVA) evaluating the effects of forest type/stand age class on plant, site and soil variables within given soil layers (Forest type: d.f. = 3, 8; Stand age class: d.f. = 2, 6).

	FR	%SWC	%Sand	%Silt	%Clay	TN _{soil}	NH ₄ -N	NO ₃ -N	pH	C/N _{soil}	DOC
Comparison among forest types											
0-5 cm	28.35***	3.00	3.23	2.98	4.04	4.42*	0.72	4.49*	8.20**	12.63**	4.41*
5-10 cm	0.56	2.94	6.22*	3.00	7.03*	7.85**	2.33	1.52	12.03**	3.01	1.30
10-20 cm	7.59*	2.8	5.75*	3.10	4.92*	9.26**	1.23	6.28*	23.95***	13.74**	0.90
Comparison among stand age classes of <i>Q. aliena</i> forest											
0-5 cm	1.61	4.81	1.11	1.52	0.60	7.77*	2.59	1.69	0.38	0.21	0.22
5-10 cm	0.32	1.47	0.95	0.12	1.47	0.15	0.14	0.05	0.96	0.50	0.08
10-20 cm	1.04	2.05	1.76	0.09	1.20	1.08	0.42	1.99	3.16	0.46	0.35

Note: * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.FR, fine root mass; %SWC, gravimetric soil water content (w/w); %Sand, percentage of sand; %Silt, percentage of silt; %Clay, percentage of clay;

TN_{soil}, soil total nitrogen; NH₄-N, ammonium nitrogen; NO₃-N, nitrate nitrogen; pH, soil pH value; C/N_{soil}, soil carbon to nitrogen ratio; DOC, dissolved organic carbon.

Table S2 Values of site, microclimatic and plant variables for comparison among contrasting forest types (means \pm standard errors; n = 3).

	Forest types				ANOVA	
	<i>Q. aliena</i>	<i>P. armandii</i> / <i>Q. aliena</i>	<i>Q. glandulifera</i>	<i>Q. variabilis</i>	<i>F</i>	<i>P</i>
BA	42.1 \pm 3.7a	43.9 \pm 4.2a	44.8 \pm 4.1a	48.0 \pm 2.6a	0.45	0.725
Slope (%)	41.1 \pm 3.0a	15.0 \pm 10.7b	24.6 \pm 8.0ab	25.6 \pm 2.2ab	2.43	0.140
T _{soil10} (°C)	11.4 \pm 0.4bc	11.1 \pm 0.3c	12.0 \pm 0.1b	13.1 \pm 0.1a	13.79	0.002
Litter _{mass}	4563.6 \pm 569.3ab	5133.7 \pm 503.0a	3956.6 \pm 663.6ab	3012.6 \pm 432.8b	2.73	0.114
Litter _{fall}	687.1 \pm 13.9a	514.9 \pm 46.7b	382.5 \pm 16.0c	456.6 \pm 9.8c	24.73	< 0.001
%N _{litter}	1.4 \pm 0.1a	1.1 \pm 0.1b	1.1 \pm 0.1b	0.9 \pm 0.0b	7.56	0.010
C/N _{litter}	35.3 \pm 0.5b	47.8 \pm 5.3a	45.5 \pm 5.4ab	53.3 \pm 5.3a	4.39	0.042
%Lignin _{litter}	29.1 \pm 2.8a	28.8 \pm 4.8a	28.0 \pm 3.4a	25.3 \pm 0.6a	0.37	0.775
Lignin/N _{litter}	20.9 \pm 1.7b	24.9 \pm 2.4ab	26.6 \pm 0.6a	27.9 \pm 2.0a	4.43	0.041
%Lignin _{root}	21.5 \pm 0.2b	44.0 \pm 4.6a	34.2 \pm 1.1ab	28.8 \pm 5.3b	7.2	0.011
Lignin/N _{root}	30.8 \pm 4.7b	58.5 \pm 5.2a	45.9 \pm 1.7ab	34.6 \pm 8.1b	5.29	0.027
C/N _{root}	70.2 \pm 3.9a	58.7 \pm 3.2a	67.3 \pm 5.4a	71.2 \pm 5.1a	1.7	0.244

Values designated by different letters for a given variable are significantly different among forest types ($P < 0.05$). BA, stem basal area ($\text{m}^2 \text{ha}^{-1}$); Slope, site slope; T_{soil10}, soil temperature at 10 cm depth; Litter_{mass}, forest floor litter mass (g m^{-2}); Litter_{fall}, annual litterfall ($\text{g m}^{-2} \text{yr}^{-1}$); %C_{litter}, litter carbon content in percentage; %N_{litter}, litter nitrogen content in percentage; C/N_{litter}, litter carbon to nitrogen ratio; %Lignin_{litter}, litter lignin content in percentage; Lignin/N_{litter}, litter lignin to nitrogen ratio; %Lignin_{root}, root lignin content in percentage; Lignin/N_{root}, root lignin to nitrogen ratio; C/N_{root}, root carbon to nitrogen ratio.

Table S3 Values of plant, microclimatic and soil variables for comparison among contrasting forest types (means \pm standard errors; n = 3).

	0 – 5 cm soil layer				5 – 10 cm soil layer				10 – 20 cm soil layer			
	<i>Q. aliena</i>	<i>P. armandii</i> / <i>Q. aliena</i>	<i>Q. glandulifera</i>	<i>Q. variabilis</i>	<i>Q. aliena</i>	<i>P. armandii</i> / <i>Q. aliena</i>	<i>Q. glandulifera</i>	<i>Q. variabilis</i>	<i>Q. aliena</i>	<i>P. armandii</i> / <i>Q. aliena</i>	<i>Q. glandulifera</i>	<i>Q. variabilis</i>
FR	3.7 \pm 0.5bc	2.7 \pm 0.2c	4.15 \pm 0.3b	5.5 \pm 0.2a	2.9 \pm 0.5a	3.1 \pm 0.7a	3.5 \pm 0.3a	3.4 \pm 0.4a	1.5 \pm 0.1a	1.0 \pm 0.1b	1.7 \pm 0.1a	1.8 \pm 0.1a
%SWC	38.5 \pm 2.7ab	42.8 \pm 10.1a	37.0 \pm 2.0ab	21.6 \pm 0.4b	31.3 \pm 2.7a	32.9 \pm 9.0a	28.2 \pm 1.8ab	14.8 \pm 0.1 b	28.4 \pm 2.3ab	30.7 \pm 8.1a	25.5 \pm 2.4ab	14.1 \pm 0.3b
%Sand	61.7 \pm 3.8b	63.0 \pm 7.8b	62.3 \pm 1.9b	78.3 \pm 0.7a	68.7 \pm 4.5b	69.3 \pm 5.5ab	57.7 \pm 0.7b	79.3 \pm 0.3a	64.3 \pm 0.9b	74.0 \pm 5.5ab	65.3 \pm 1.7b	79.0 \pm 0.6a
%Silt	10.7 \pm 1.7ab	9.0 \pm 1.5b	13.7 \pm 0.3a	8.7 \pm 1.3b	11.3 \pm 2.3ab	8.0 \pm 1.0b	13.7 \pm 1.5a	9.0 \pm 0.0ab	11.4 \pm 1.5a	6.7 \pm 1.2b	10.0 \pm 1.0ab	9.7 \pm 0.7ab
%Clay	27.6 \pm 2.2a	28.0 \pm 6.4a	24.0 \pm 1.5ab	13.0 \pm 1.2b	20.0 \pm 2.3ab	22.7 \pm 4.5a	28.6 \pm 1.7a	11.7 \pm 0.3b	24.3 \pm 2.2a	19.3 \pm 4.8ab	24.7 \pm 1.9a	11.3 \pm 0.3b
TN _{soil}	4.69 \pm 0.1a	3.51 \pm 1.2ab	2.69 \pm 0.2b	2.37 \pm 0.1b	2.41 \pm 0.2a	1.51 \pm 0.3b	1.57 \pm 0.2b	1.00 \pm 0.0b	1.99 \pm 0.1a	1.15 \pm 0.3b	0.94 \pm 0.0b	0.70 \pm 0.0b
NH ₄ -N	48.5 \pm 3.6a	49.1 \pm 11.5a	49.3 \pm 6.2a	39.6 \pm 0.9a	31.3 \pm 3.1a	34.3 \pm 8.1a	34.0 \pm 0.7a	20.2 \pm 0.3a	24.4 \pm 2.9a	27.4 \pm 8.1a	21.0 \pm 1.4a	16.1 \pm 0.1a
NO ₃ -N	2.6 \pm 0.4ab	2.9 \pm 1.1a	1.0 \pm 0.1c	1.2 \pm 0.2bc	1.7 \pm 0.6a	2.2 \pm 0.9a	0.9 \pm 0.1a	0.9 \pm 0.1a	1.7 \pm 0.1a	1.8 \pm 0.4a	0.9 \pm 0.1b	0.8 \pm 0.0b
pH	4.6 \pm 0.1a	4.6 \pm 0.1a	4.2 \pm 0.1b	4.2 \pm 0.0b	4.5 \pm 0.1 a	4.5 \pm 0.1a	4.2 \pm 0.0b	4.2 \pm 0.0b	4.6 \pm 0.0a	4.6 \pm 0.0a	4.3 \pm 0.1b	4.3 \pm 0.0b
C/N _{soil}	13.5 \pm 0.3c	15.5 \pm 0.8b	17.4 \pm 0.6a	17.7 \pm 0.2a	13.9 \pm 0.2b	15.8 \pm 1.0a	15.3 \pm 0.2ab	16.1 \pm 0.6a	13.8 \pm 0.6b	14.9 \pm 0.2b	16.0 \pm 0.4ab	16.5 \pm 0.6a
DOC	149.0 \pm 22.8b	198.7 \pm 11.4ab	254.9 \pm 27.6a	190.1 \pm 17.7ab	157.7 \pm 17.3a	177.1 \pm 5.7a	216.0 \pm 16.9a	183.6 \pm 34.6a	144.7 \pm 17.7a	153.4 \pm 20.6a	183.6 \pm 28.3a	179.3 \pm 9.4a

Values designated by different letters for a given variable are significantly different among forest types within given soil layers ($P < 0.05$). FR, fine root mass (g kg^{-1} soil); %SWC, gravimetric soil water content (w/w); %Sand, percentage of sand; %Silt, percentage of silt; %Clay, percentage of clay; TN_{soil}, soil total nitrogen (g kg^{-1} soil); NH₄-N, ammonium nitrogen (mg kg^{-1} soil); NO₃-N, nitrate nitrogen (mg kg^{-1} soil); pH, soil pH value; C/N_{soil}, soil carbon to nitrogen ratio; DOC, dissolved organic carbon (mg kg^{-1} soil).

Table S4 Values of microclimatic and plant variables and summary of ANOVA for comparison among contrasting stand age classes of the *Q. aliena* forest (means \pm standard errors; n = 3).

	Stand age class			ANOVA	
	40-yrs stand	80-yrs stand	160-yrs stand	<i>F</i>	<i>P</i>
BA	44.6 \pm 3.8a	42.1 \pm 3.7a	46.8 \pm 2.6a	0.47	0.645
Slope (%)	42.9 \pm 8.1a	41.1 \pm 3.0a	40.5 \pm 3.1a	0.06	0.944
T _{soil10} (°C)	11.8 \pm 0.1a	11.4 \pm 0.4a	11.1 \pm 0.1a	2.22	0.190
Litter _{mass}	5534.8 \pm 759.4a	4563.6 \pm 569.3a	5753.9 \pm 566.5a	0.99	0.426
Litter _{fall}	655.5 \pm 183.7a	687.1 \pm 13.9a	627.9 \pm 61.2a	0.07	0.933
%N _{litter}	1.3 \pm 0.1a	1.4 \pm 0.1a	1.4 \pm 0.1a	0.32	0.740
C/N _{litter}	37.9 \pm 1.6a	35.3 \pm 0.5a	37.7 \pm 3.3a	0.72	0.526
%Lignin _{litter}	27.8 \pm 5.4a	29.1 \pm 2.8a	29.6 \pm 1.0a	0.04	0.963
Lignin/N _{litter}	21.1 \pm 4.3a	20.9 \pm 1.7a	21.9 \pm 0.7a	0.02	0.981
%Lignin _{root}	25.3 \pm 2.2a	21.5 \pm 0.2a	26.0 \pm 4.4a	0.71	0.529
Lignin/N _{root}	32.7 \pm 1.4a	30.8 \pm 4.7a	39.7 \pm 2.8a	2.06	0.209
C/N _{root}	77.4 \pm 5.4a	70.2 \pm 3.9a	73.5 \pm 6.3a	0.47	0.645

Values designated by different letters for a given variable are significantly different among stand age classes ($P < 0.05$). BA, stem basal area ($\text{m}^2 \text{ha}^{-1}$); Slope, site slope; T_{soil10}, soil temperature at 10 cm depth; Litter_{mass}, forest floor litter mass (g m^{-2}); Litter_{fall}, annual litterfall ($\text{g m}^{-2} \text{yr}^{-1}$); %C_{litter}, litter carbon content in percentage; %N_{litter}, litter nitrogen content in percentage; C/N_{litter}, litter carbon to nitrogen ratio; %Lignin_{litter}, litter lignin content in percentage; Lignin/N_{litter}, litter lignin to nitrogen ratio; %Lignin_{root}, root lignin content in percentage; Lignin/N_{root}, root lignin to nitrogen ratio; C/N_{root}, root carbon to nitrogen ratio.

Table S5 Values of plant, microclimatic and soil variables for comparison among contrasting stand age classes of the *Q. aliena* forest (means \pm standard errors; n = 3).

	0 - 5 cm soil layer			5 - 10 cm soil layer			10 - 20 cm soil layer		
	40-yrs stand	80-yrs stand	160-yrs stand	40-yrs stand	80-yrs stand	160-yrs stand	40-yrs stand	80-yrs stand	160-yrs stand
FR	3.7 \pm 0.5a	2.7 \pm 0.2a	3.8 \pm 0.6a	2.9 \pm 0.5a	2.8 \pm 0.1a	3.1 \pm 0.1a	1.5 \pm 0.1a	1.3 \pm 0.1a	1.2 \pm 0.2a
%SWC	41.8 \pm 0.6ab	38.5 \pm 2.7b	47.4 \pm 2.2a	34.6 \pm 1.1a	31.3 \pm 2.7a	36.7 \pm 2.6a	33.3 \pm 1.8a	28.4 \pm 2.3a	31.3 \pm 0.6a
%Sand	57.3 \pm 1.8a	61.6 \pm 3.8a	56.7 \pm 1.5a	60.3 \pm 5.7a	68.7 \pm 4.5a	64.3 \pm 1.5a	65.6 \pm 0.3a	64.3 \pm 0.9a	63.3 \pm 1.2a
%Silt	12.7 \pm 1.7a	10.7 \pm 1.7a	14.0 \pm 0.0a	11.0 \pm 0.0a	11.3 \pm 2.3a	12.0 \pm 1.0a	11.7 \pm 0.7a	11.4 \pm 1.5a	11.0 \pm 1.2a
%Clay	30.0 \pm 0.6a	27.7 \pm 2.2a	29.3 \pm 1.5a	28.7 \pm 5.7a	20.0 \pm 2.3a	23.7 \pm 0.9a	22.7 \pm 0.9a	24.3 \pm 2.2a	25.7 \pm 0.3a
TN _{soil}	4.2 \pm 0.0b	4.7 \pm 0.1a	4.5 \pm 0.1a	2.3 \pm 0.3a	2.4 \pm 0.2a	2.4 \pm 0.1a	1.8 \pm 0.1a	2.0 \pm 0.1a	2.1 \pm 0.2a
NH ₄ -N	51.8 \pm 2.6a	48.5 \pm 3.6a	59.7 \pm 6.2a	33.7 \pm 4.3a	31.3 \pm 3.1a	32.6 \pm 2.6a	27.6 \pm 3.6a	24.4 \pm 2.9a	24.5 \pm 1.7a
NO ₃ -N	3.3 \pm 0.3a	2.7 \pm 0.4a	3.4 \pm 0.4a	1.8 \pm 0.4a	1.7 \pm 0.6a	2.0 \pm 0.8a	1.6 \pm 0.2a	1.7 \pm 0.1a	1.9 \pm 0.1a
pH	4.6 \pm 0.1a	4.6 \pm 0.1a	4.5 \pm 0.1a	4.5 \pm 0.1a	4.5 \pm 0.1a	4.4 \pm 0.1a	4.7 \pm 0.0a	4.6 \pm 0.0a	4.6 \pm 0.1a
C/N _{soil}	13.6 \pm 0.2a	13.5 \pm 0.3a	13.4 \pm 0.2a	13.5 \pm 0.5a	13.9 \pm 0.2a	13.7 \pm 0.2a	14.4 \pm 0.3a	13.8 \pm 0.6a	13.6 \pm 0.8a
DOC	164.2 \pm 21.3a	149.0 \pm 22.8a	166.3 \pm 15.6a	168.5 \pm 23.4a	157.7 \pm 17.3a	157.7 \pm 25.5a	166.3 \pm 11.4a	144.7 \pm 17.7a	155.5 \pm 23.4a

Values designated by different letters for a given variable are significantly different among stand age classes within given soil layers ($P < 0.05$). FR, fine root mass (g kg^{-1} soil); %SWC, gravimetric soil water content (w/w); %Sand, percentage of sand; %Silt, percentage of silt; %Clay, percentage of clay; TN_{soil}, soil total nitrogen (g kg^{-1} soil); NH₄-N, ammonium nitrogen (mg kg^{-1} soil); NO₃-N, nitrate nitrogen (mg kg^{-1} soil); pH, soil pH value; C/N_{soil}, soil carbon to nitrogen ratio; DOC, dissolved organic carbon (mg kg^{-1} soil).

Table S6 Summary of *F*-values and significance level in repeated measures analysis of variance (RMANOVA) evaluating the effects of forest type/stand age class (between subjects) and sampling time (within subjects) on microbial biomass C (MBC), microbial biomass N (MBN), microbial C to N ratio (C_{mic}/N_{mic}), microbial respiration (MR), and microbial metabolic quotient (qCO_2) within given soil layers.

		Comparison among forest types						Comparison among stand age classes of <i>Q. aliena</i> forest					
		Forest type (<i>FT</i>)		Sampling time (<i>ST</i>)		<i>FT</i> × <i>ST</i>		Stand age (<i>SA</i>)		Sampling time (<i>ST</i>)		<i>SA</i> × <i>ST</i>	
		d.f.	F	d.f.	F	d.f.	F	d.f.	F	d.f.	F	d.f.	F
0-5 cm	MBC	(3,8)	6.91*	(6,48)	4.80**	(18,48)	1.02	(2,6)	1.20	(6,36)	14.52***	(12,36)	1.39
	MBN	(3,8)	12.27**	(6,48)	7.63***	(18,48)	1.75	(2,6)	1.55	(6,36)	4.39**	(12,36)	0.55
	C_{mic}/N_{mic}	(3,8)	5.71*	(6,48)	5.32***	(18,48)	0.62	(2,6)	1.24	(6,36)	4.43**	(12,36)	0.87
	MR	(3,8)	1.73	(1.71,13.69)	5.60*	(5.13,13.69)	1.06	(2,6)	3.98	(2.25,13.50)	15.93***	(4.50,13.50)	0.72
	qCO_2	(3,8)	5.37*	(6,48)	1.56	(18,48)	0.98	(2,6)	0.03	(2.38,14.27)	2.92*	(4.76,14.27)	1.40
5-10 cm	MBC	(3,8)	7.72*	(2.64,21.15)	6.43***	(7.92,21.15)	3.98**	(2,6)	9.15*	(6,36)	7.64***	(12,36)	3.16**
	MBN	(3,8)	7.35*	(6,48)	1.97	(18,48)	0.93	(2,6)	0.40	(2.64,15.85)	0.55	(5.28,15.85)	0.85
	C_{mic}/N_{mic}	(3,8)	4.81*	(3.06,24.49)	1.24	(9.18,24.49)	1.60	(2,6)	0.26	(2.35,14.12)	1.07	(4.70,14.12)	1.76
	MR	(3,8)	4.60*	(2.01,16.05)	7.76**	(6.03,16.05)	4.76**	(2,6)	0.97	(2.20,13.22)	14.73***	(4.40,13.22)	1.02
	qCO_2	(3,8)	5.39*	(6,48)	3.32**	(18,48)	2.18*	(2,6)	1.06	(6,36)	2.24	(12,36)	1.70
10-20 cm	MBC	(3,8)	5.24*	(2.11,16.89)	0.81	(6.33,16.89)	1.76	(2,6)	1.53	(2.37,14.20)	2.67*	(4.74,14.20)	2.73*
	MBN	(3,8)	6.16*	(6,48)	0.78	(18,48)	1.06	(2,6)	0.26	(6,36)	1.97	(12,36)	0.57
	C_{mic}/N_{mic}	(3,8)	0.93	(2.04,16.32)	0.51	(6.12,16.32)	1.12	(2,6)	0.71	(6,36)	1.42	(12,36)	1.67
	MR	(3,8)	9.03**	(1.62,12.97)	14.94**	(4.86,12.97)	4.94*	(2,6)	0.55	(6,36)	3.47**	(12,36)	0.35
	qCO_2	(3,8)	4.38*	(6,48)	3.15*	(18,48)	1.71	(2,6)	0.48	(2.75,16.48)	3.01	(5.50,16.48)	1.75

Note: Greenhouse-Geisser correction was applied when the sphericity assumption was violated. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table S7 Summary of *F*-values and significance level in RMANOVA evaluating the effects of forest type/stand age class (between subjects) and sampling time (within subjects) on total activities of β -1,4-glucosidase (BG), β -1,4-N-acetylglucosaminidase (NAG), phenol oxidase (PO) and peroxidase (PER) within given soil layers.

		Comparison among forest types						Comparison among stand age classes of <i>Q. aliena</i> forest					
		Forest type (<i>FT</i>)		Sampling time (<i>ST</i>)		<i>FT</i> × <i>ST</i>		Stand age (<i>SA</i>)		Sampling time (<i>ST</i>)		<i>SA</i> × <i>ST</i>	
		d.f.	F	d.f.	F	d.f.	F	d.f.	F	d.f.	F	d.f.	F
0-5 cm	BG	(3,8)	9.03**	(6,48)	1.75	(18,48)	1.32	(2,6)	4.73	(6,36)	2.06	(12,36)	0.92
	NAG	(3,8)	4.30*	(2.30,18.43)	5.81**	(6.90,18.43)	2.70*	(2,6)	2.74	(6,36)	5.44***	(12,36)	1.23
	PO	(3,8)	3.46	(3.16,25.27)	8.98***	(9.48,25.27)	2.15	(2,6)	1.06	(6,36)	6.88***	(12,36)	1.13
	PER	(3,8)	2.09	(2.27,18.12)	4.34*	(6.80,18.12)	0.90	(2,6)	0.03	(2.50,14.98)	7.55**	(5.00,14.98)	0.16
5-10 cm	BG	(3,8)	4.75*	(6,48)	8.13***	(18,48)	0.72	(2,6)	1.34	(1.91,11.47)	5.84*	(3.82,11.47)	0.39
	NAG	(3,8)	0.93	(1.75,14.01)	2.66	(5.25,14.01)	0.66	(2,6)	2.15	(1.49,8.93)	1.58	(2.98,8.93)	1.15
	PO	(3,8)	4.37*	(2.76,22.07)	36.71***	(8.28,22.07)	2.76*	(2,6)	2.45	(1.93,11.57)	5.16*	(3.86,11.57)	1.73
	PER	(3,8)	5.74*	(2.30,18.40)	2.65*	(6.90,18.40)	0.56	(2,6)	5.69*	(1.96,11.75)	4.34	(3.92,11.75)	0.41
10-20 cm	BG	(3,8)	5.46*	(6,48)	12.20***	(18,48)	1.78	(2,6)	0.12	(1.00,6.01)	0.81	(2.00,6.01)	0.99
	NAG	(3,8)	4.31*	(1.69,13.53)	6.12*	(5.07,13.53)	1.70	(2,6)	0.19	(1.49,8.94)	1.82	(2.98,8.94)	0.54
	PO	(3,8)	4.27*	(2.73,21.84)	4.39*	(8.19,21.84)	2.43*	(2,6)	1.69	(2.15,12.89)	6.90**	(4.30,12.89)	0.29
	PER	(3,8)	4.45*	(2.87,22.98)	1.45	(8.61,22.98)	1.45	(2,6)	2.90	(2.09,12.56)	1.99	(4.18,12.56)	0.89

Note: Greenhouse-Geisser correction was applied when the sphericity assumption was violated. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table S8 Summary of *F*-values and significance level in RMANOVA evaluating the effects of forest type/stand age class (between subjects) and sampling time (within subjects) on microbial biomass-specific activities of β -1,4-glucosidase (BG), β -1,4-N-acetylglucosaminidase (NAG), phenol oxidase (PO) and peroxidase (PER) within given soil layers.

		Comparison among forest types						Comparison among stand age classes of <i>Q. aliena</i> forest					
		Forest type (<i>FT</i>)		Sampling time (<i>ST</i>)		<i>FT</i> × <i>ST</i>		Stand age (<i>SA</i>)		Sampling time (<i>ST</i>)		<i>SA</i> × <i>ST</i>	
		d.f.	F	d.f.	F	d.f.	F	d.f.	F	d.f.	F	d.f.	F
0-5 cm	BG	(3,8)	8.01**	(2.75,22.00)	4.99*	(8.25,22.00)	0.75	(2,6)	0.76	(6,36)	4.11**	(12,36)	0.77
	NAG	(3,8)	4.54*	(6,48)	6.29***	(18,48)	2.55**	(2,6)	0.26	(1.83,10.97)	4.33*	(3.66,10.97)	0.99
	PO	(3,8)	15.38**	(6,48)	4.32**	(18,48)	1.11	(2,6)	2.17	(6,36)	10.67***	(12,36)	1.22
	PER	(3,8)	16.32**	(6,48)	4.19**	(18,48)	0.89	(2,6)	0.27	(6,36)	8.10***	(12,36)	0.38
5-10 cm	BG	(3,8)	4.74*	(3.38,27.04)	7.47**	(10.14,27.04)	1.83	(2,6)	0.15	(6,36)	9.16***	(12,36)	0.97
	NAG	(3,8)	1.05	(1.29,10.35)	2.63	(3.87,10.35)	0.48	(2,6)	3.17	(6,36)	2.93*	(12,36)	1.55
	PO	(3,8)	10.17**	(1.69,13.48)	2.85	(5.07,13.48)	2.79	(2,6)	1.15	(6,36)	3.25*	(12,36)	1.57
	PER	(3,8)	17.65**	(1.44,11.53)	2.28	(4.32,11.53)	1.22	(2,6)	1.09	(6,36)	6.25***	(12,36)	1.00
10-20 cm	BG	(3,8)	4.23*	(6,48)	6.62***	(18,48)	1.31	(2,6)	0.11	(1.00,6.03)	0.74	(2.00,6.03)	0.98
	NAG	(3,8)	1.21	(6,48)	6.14***	(18,48)	2.32*	(2,6)	0.35	(1.62,9.71)	3.33	(3.24,9.71)	1.08
	PO	(3,8)	4.22*	(2.36,18.89)	4.31*	(7.08,18.89)	2.59*	(2,6)	0.71	(1.52,9.10)	2.85	(3.04,9.10)	0.57
	PER	(3,8)	8.83**	(2.63,21.03)	0.79	(7.89,21.03)	0.86	(2,6)	1.48	(1.96,11.75)	2.08	(3.92,11.75)	1.08

Note: Greenhouse-Geisser correction was applied when the sphericity assumption was violated. **P* < 0.05; ***P* < 0.01; *** *P* < 0.001.