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Supplement of

Dissolved organic matter characteristics of deciduous and coniferous forests with variable management: different at the source, aligned in the soil

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Table S1: Site and plot description.

	Schwäbische Alb (ALB)			Hainich-Dün (HAI)			Schorfheide-Chorin (SCH)		
site description									
Location	Southwest Germany (53° 2´ N, 13° 51` E)			Central Germany (51° 10' N, 10° 23' E)			Northeast Germany (53° 2' N, 13° 51' E)		
Altitude	460-860 m a.s.l.			285 - 550 m a.s.l.			3-140 m a.s.l.		
Mean anual temperature	6-7°C			6.5-8°C			8-8.5 °C		
Mean anual precipitation	700-1000mm			500-800 mm			500-600 mm		
Bedrock	Jurassic limestone			Triassic limestone with loess cover			Quartzitic glacial till		
Main soil types	Leptosols, Cambisols			Luvisols, Stagnosols			Cambisols, Albeluvisols		
Main tree species	*Fagus sylvatica* L. Picea abies (L.) H. Karst.			*Fagus sylvatica* L. Picea abies (L.) H. Karst. Fraxinus exelsior L.			*Fagus sylvatica* L. Pinus sylvestris L. Quercus spp.		
plot description									
Plot ID	AEW1-AEW3	AEW4 - AEW6	AEW7 - AWE9	HEW1 - HWE3	HEW4 - HEW6	HEW10 - HEW12	SEW1 - SEW3	SEW5 - SEW6	SEW7 - SEW9
Main tree species	spruce	beech	beech	spruce	beech	Beech	pine	beech	beech
Management category	coniferous age-class	deciduous age-class	unmanaged	coniferous age-class	deciduous age-class	unmanaged	coniferous age-class	deciduous age-class	unmanaged
Stand density (n ha-1)	480 - 752	104 - 2219	312 - 444	320 - 720	thicket; 488; 300	260 - 564	444 - 1440	92, thicket	168 - 284
Mean dbh (cm)	26.3 - 32.2	12.4 - 45.2	27.1 - 36.4	25.2 - 40.2	NA, 24.7, 38.7	22.8 - 35.0	17.3 - 33.1	57.2, NA	40.7 - 51.0
Basal area (m^2 ha-1)	44.0 - 44.5	18.0 - 28.7	31.4 - 46.9	28.3 - 42.4	NA, 28.3, 39.5	35.4 - 39.3	36.4 - 39.9	28.2, NA	39.3 - 43.4
ForMI	1.8052 - 2.3536	0.9392 -1.5632	0.0000 - 1.0285	1.3073 - 2.1979	1.890, 0.9556, 0.7467	0.0000 - 0.5177	1.4052 -1.9003	0.6890, 1.4018	0.0855 - 0.6459

Table S2:Sample information. DOM characterization: fluorescence. TF = Throughfall, SF = Stemflow, LL = Litter Leachate, TOP = Topsoil solution, SUB = Subsoil Solution.

site	management category	plot ID	sample number per ecosystem flux				
			TF	SF	LL	TOP	SUB
Hainich Dün	coniferous age-class	HEW1	3	1	2	2	2
		HEW2	3	2	2	2	2
		HEW3	2	2	2	1	2
	deciduous age-class	HEW4	1	NA	2	NA	NA
		HEW5	2	3	2	2	2
		HEW6	3	3	2	2	2
	beech unmanaged	HEW10	2	3	2	2	NA
		HEW11	3	2	2	2	2
		HEW12	3	1	3	2	2
Schorfheide Chorin	coniferous age-class	SEW1	10	10	15	1	6
		SEW2	12	13	12	NA	2
		SEW3	12	9	13	2	2
	deciduous age-class	SEW5	10	13	9	3	1
		SEW6	11	13	16	3	7
	beech unmanaged	SEW7	10	11	13	4	NA
		SER8	10	15	9	3	4
		SEW9	12	11	9	3	3

Table S3: Sample information. DOM characterization: FTICR-MS. TF = Throughfall, SF = Stemflow, LL = Litter Leachate, TOP = Topsoil solution, SUB = Subsoil Solution.

site	management category	plot composition per ecosystem flux			
		TF	SF	LL	SUB
Schorfheide-Chorin	coniferous age-class	SEW1+3	SEW1+3	SEW1+3	SEW1+3
	beech unmanaged	SEW8+9	SEW8+9	SEW8+9	SEW8+9

Table S4: Sample information. DOM biodegradability. TF = Throughfall, SF = Stemflow, LL = Litter Leachate, TOP = Topsoil solution, SUB = Subsoil Solution.

site	management category	plot composition per ecosystem flux		
		TF	SF	LL
Schwäbische Alb	coniferous age-class	AEW1-3	NA	AEW1-3
	deciduous age-class	AEW4-6	AEW4-6	AEW4-6
	beech unmanaged	AEW7-9	AEW7-9	NA
Hainich Dün	coniferous age-class	HEW1-3	HEW1-3	HEW1+2
	deciduous age-class	HEW5+6	HEW5+6	HEW5+6
	beech unmanaged	HWE10-12	HWE10-12	HWE10-12
Schorfheide Chorin	coniferous age-class	SEW1-3	SEW1-3	SEW1-3
	deciduous age-class	SEW4+5	SEW4+5	SEW4+5
	beech unmanaged	SEW6-9	SEW6-9	SEW6-9

Table S5: Calculated degradation rate constants (k) and relative amount of biodegradable dissolved organic carbon (BDOC) for different ecosystem fluxes in the Schwäbische Alb (ALB), the Hainich Dün (HAI) and the Schorfheide Chorin (SCH) sites. K was calculated using a two parameter single exponential model.

	site	management category	k [d^{-1}]	St. Error	BDOC [%]
throughfall	SCH	coniferous age-class	0.0063	0.0008	17
	ALB	coniferous age-class	0.0081	0.0013	18
	HAI	deciduous age-class	0.0082	0.0011	19
	ALB	unmanaged	0.0116	0.0017	23
	ALB	deciduous age-class	0.0106	0.0017	24
	HAI	coniferous age-class	0.0098	0.0019	27
	SCH	deciduous age-class	0.0136	0.0023	29
	SCH	unmanaged	0.0154	0.0009	34
	HAI	unmanaged	0.0148	0.0032	36
stemflow	HAI	deciduous age-class	0.0052	0.0015	15
	SCH	coniferous age-class	0.0084	0.0011	18
	HAI	unmanaged	0.0116	0.0013	30
	SCH	unmanaged	0.0122	0.0018	30
	ALB	deciduous age-class	0.0179	0.0030	32
	SCH	deciduous age-class	0.0183	0.0012	38
	HAI	coniferous age-class	0.0175	0.0016	40
	ALB	unmanaged	0.0213	0.0021	40
litter leachate	ALB	coniferous age-class	0.0040	0.0012	8
	SCH	coniferous age-class	0.0047	0.0011	10
	SCH	unmanaged	0.0050	0.0011	11
	SCH	deciduous age-class	0.0049	0.0012	11
	ALB	deciduous age-class	0.0070	0.0021	12
	HAI	coniferous age-class	0.0052	0.0018	17
	HAI	unmanaged	0.0057	0.0012	17
	HAI	deciduous age-class	0.0059	0.0011	18

Table S6: sample information: DOM biodegradability. Mean concentrations of nitrogen and phosphor in samples before incubation. NH_4-N + NO_3-N = concentration of ammonium and nitrate nitrogen, PO_4-P = concentration of ortho phophate

	TF		SF		LL	
	NH_4-N + NO_3-N [mg L^{-1}]	PO_4-P [mg L^{-1}]	NH_4-N + NO_3-N [mg L^{-1}]	PO_4-P [mg L^{-1}]	NH_4-N + NO_3-N [mg L^{-1}]	PO_4-P [mg L^{-1}]
Schwäbische Alb						
coniferous age-class	1.42	0.047			3.85	0.206
deciduous age-class	1.02	0.144	4.37	0.830	0.82	0.184
unmanaged	1.45	0.052	3.44	0.136	5.14	0.349
Hainich Dün						
coniferous age-class	7.39	0.330	18.68	0.086	4.95	0.113
deciduous age-class	2.97	0.146	2.24	0.008	5.23	0.828
unmanaged	2.44	0.124	2.19	0.017	7.17	1.158
Schorfheide Chorin						
coniferous age-class	0.92	0.018	6.57	0.015	0.77	0.301
deciduous age-class	0.71	0.232	1.34	0.124	7.04	0.323
unmanaged	2.27	0.727	1.25	0.130	1.97	0.504

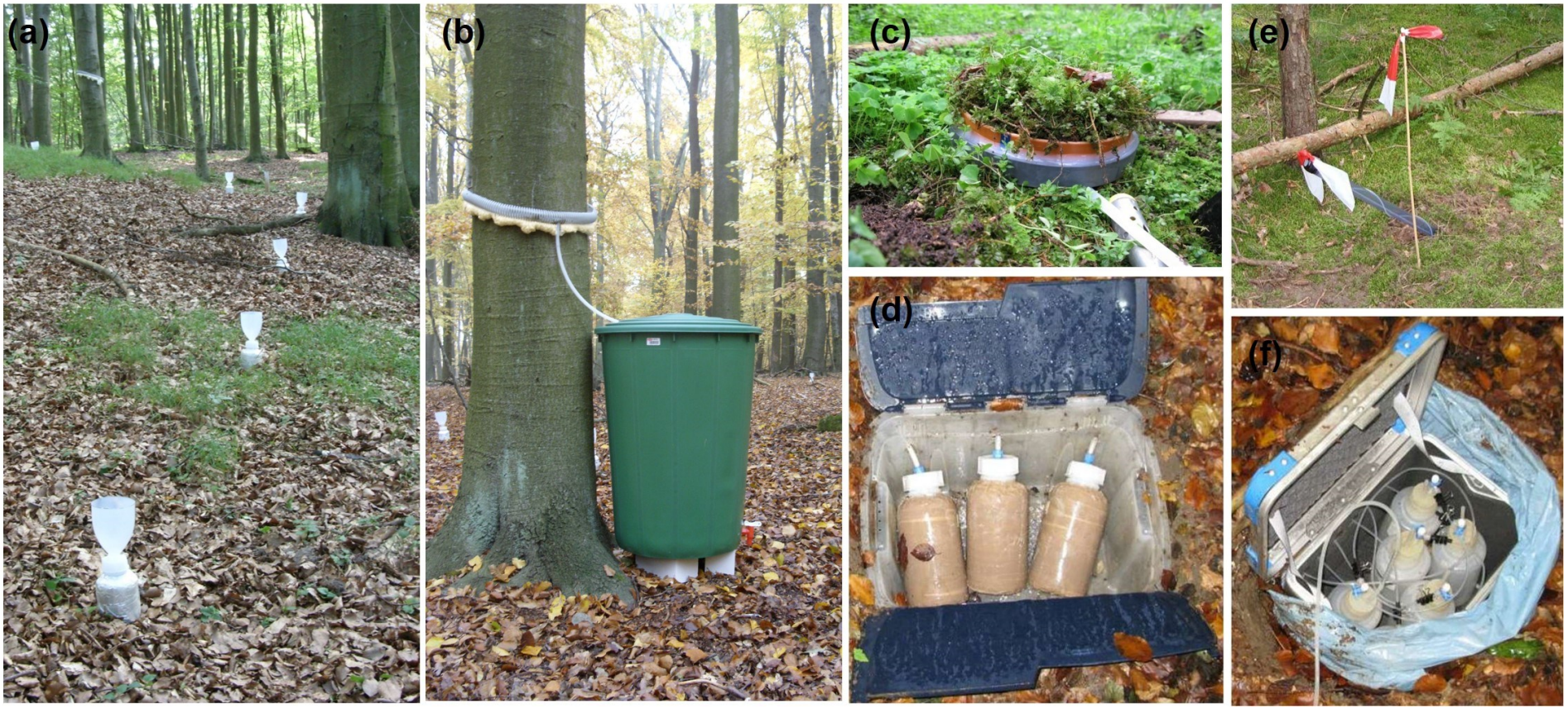

Figure S1: Fotos of sampling installations on forest plots. (a) Throughfall (TF) collection bottels, (b) Stemflow (SF) collection collar on beech tree, connected with a 200 L barrel, (c) Litter Leachate (LL) collector and (d) collection bottles (free draining), (e) aboveground view of suction cubs for Soil Solution (TOP and SUB) sampling and (f) collection bottles (manual applied preassure).

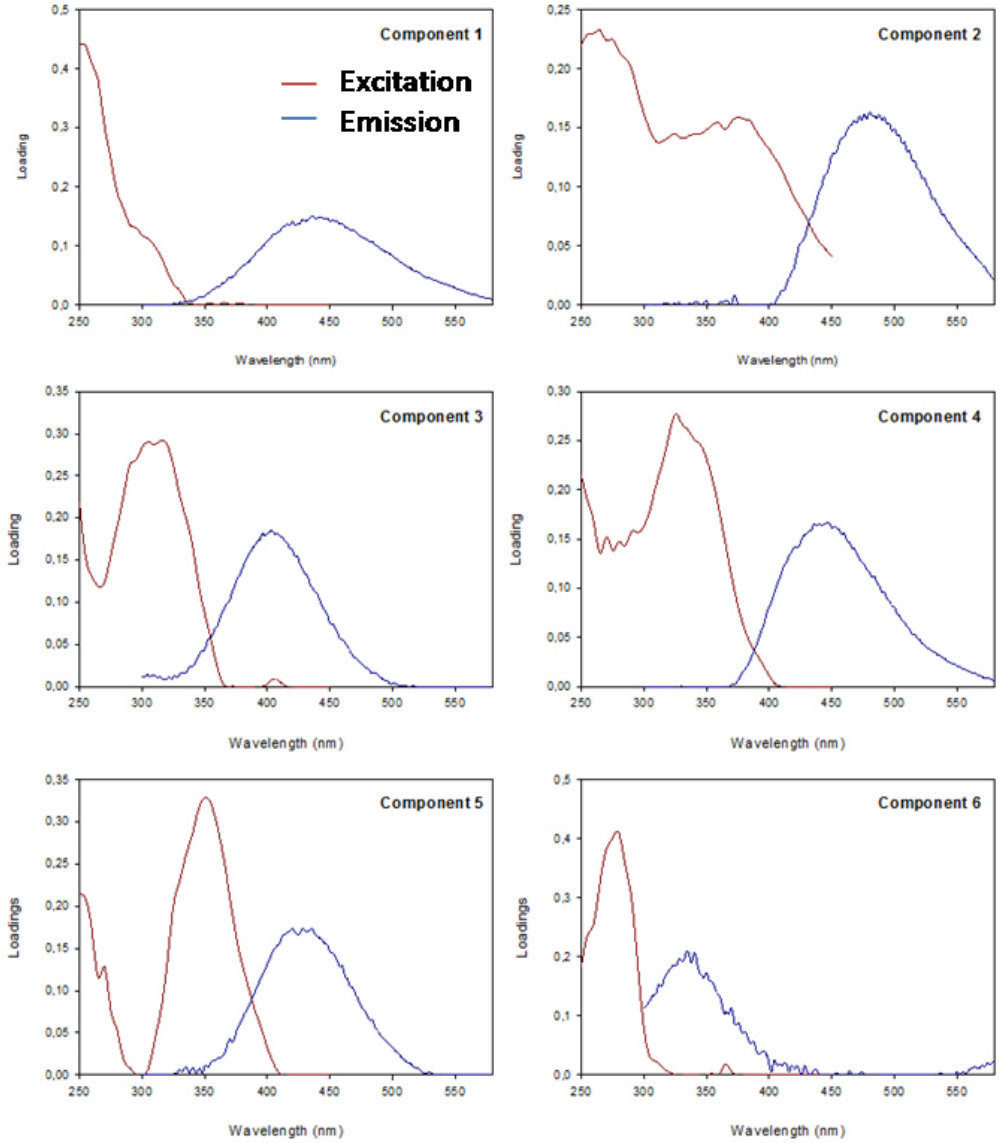

Figure S2: Excitation (red) and emission (blue) spectra of PARAFAC components (C1-C6).