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Supplement of

Paleosols can promote root growth of the recent vegetation – a case study from the sandy soil-sediment sequence Rakt, the Netherlands

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Supplementary Table 1: Depth distribution of color index b*, with high values indicating yellow and low values indicating blue color, as well as most relevant elements.

Unit	Depth [m]	Color [] b*	Element contents [wt-%]								
			Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	S	K ₂ O	MnO (x10 ⁻³)	Cu (x10 ⁻⁴)	Mo (x10 ⁻⁴)
EP ^a	0.00-0.10	5.3 ± 0.4	0.70 ± 0.04	0.09 ± 0.01	2.5 ± 0.0	86.5 ± 0.9	0.08 ± 0.01	1.00 ± 0.01	4.5 ± 0.2	2.3 ± 0.3	3.1 ± 0.2
	0.10-0.20	7.2 ± 0.2	0.65 ± 0.05	0.08 ± 0.01	2.3 ± 0.1	87.1 ± 1.2	0.03 ± 0.00	0.94 ± 0.03	3.6 ± 0.1	1.4 ± 0.1	3.2 ± 0.1
	0.20-0.30	8.7 ± 0.2	0.59 ± 0.07	0.09 ± 0.01	2.4 ± 0.1	89.0 ± 1.1	0.02 ± 0.00	0.88 ± 0.01	3.1 ± 0.3	0.4 ± 0.2	2.6 ± 0.3
ds ^a	0.25-0.35	7.1 ± 1.1	0.64 ± 0.02	0.11 ± 0.03	2.6 ± 0.3	88.5 ± 0.3	0.02 ± 0.01	0.94 ± 0.03	3.8 ± 0.7	1.1 ± 0.6	3.1 ± 0.2
	0.40-0.50	8.9 ± 0.1	0.54 ± 0.04	0.09 ± 0.01	2.2 ± 0.1	89.9 ± 4.1	0.01 ± 0.00	0.90 ± 0.05	4.0 ± 0.4	0.6 ± 0.6	3.2 ± 0.5
PA ^a	0.40-0.50	6.7 ± 0.5	0.60 ± 0.02	0.13 ± 0.01	2.8 ± 0.3	88.3 ± 0.8	0.03 ± 0.01	0.90 ± 0.04	5.8 ± 0.5	1.6 ± 0.6	2.7 ± 0.0
	0.50-0.60	7.9 ± 1.4	0.55 ± 0.07	0.13 ± 0.02	3.0 ± 0.4	87.0 ± 1.3	0.03 ± 0.01	0.89 ± 0.04	4.2 ± 0.6	0.2 ± 0.2	2.9 ± 0.4
	0.60-0.70	4.8 ± 0.1	0.60 ± 0.05	0.17 ± 0.02	3.6 ± 0.2	85.3 ± 1.4	0.06 ± 0.01	0.93 ± 0.01	6.8 ± 0.8	1.5 ± 0.1	2.7 ± 0.5
	0.75-0.85	4.3 ± 0.2	0.55 ± 0.03	0.16 ± 0.02	3.4 ± 0.2	86.3 ± 1.7	0.05 ± 0.01	0.93 ± 0.01	7.9 ± 1.1	3.3 ± 0.1	3.2 ± 0.5
	0.90-1.00	4.5 ± 0.3	0.65 ± 0.04	0.16 ± 0.01	3.4 ± 0.2	85.4 ± 0.5	0.06 ± 0.01	0.92 ± 0.01	5.7 ± 0.2	2.2 ± 0.3	3.9 ± 0.5
	1.05-1.15	4.0 ± 0.2	0.60 ± 0.02	0.16 ± 0.01	3.6 ± 0.1	86.4 ± 0.4	0.07 ± 0.00	0.95 ± 0.01	5.7 ± 0.4	3.9 ± 0.5	3.7 ± 0.4
	1.20-1.30	3.2 ± 0.2	0.60 ± 0.05	0.17 ± 0.02	3.8 ± 0.1	83.6 ± 1.1	0.08 ± 0.01	0.88 ± 0.02	5.5 ± 0.2	3.1 ± 0.4	3.4 ± 0.0
1.35-1.45	3.6 ± 0.1	0.69 ± 0.03	0.16 ± 0.00	3.5 ± 0.0	84.2 ± 0.2	0.06 ± 0.00	0.88 ± 0.01	6.3 ± 0.4	2.6 ± 0.5	4.1 ± 0.0	
rEP ^a	1.50-1.60	4.1 ± 0.4	0.84 ± 0.03	0.27 ± 0.01	7.2 ± 0.2	75.5 ± 0.4	0.07 ± 0.00	1.08 ± 0.01	13.4 ± 3.2	1.3 ± 0.7	3.0 ± 0.1
	1.65-1.75	4.3 ± 0.4	0.76 ± 0.12	0.34 ± 0.03	7.8 ± 0.1	76.6 ± 0.5	0.06 ± 0.00	1.04 ± 0.00	6.6 ± 0.4	0.6 ± 0.6	2.3 ± 0.3
	1.80-1.90	11.1 ± 0.3	0.76 ± 0.02	0.24 ± 0.02	4.3 ± 0.0	86.4 ± 1.2	0.02 ± 0.00	1.05 ± 0.01	7.8 ± 0.6	0.7 ± 0.7	2.8 ± 0.1
cs ^a	1.95-2.05	9.6 ± 0.4	0.90 ± 0.02	0.27 ± 0.02	4.6 ± 0.2	85.4 ± 0.6	0.02 ± 0.00	1.13 ± 0.04	7.8 ± 0.4	0.2 ± 0.1	2.7 ± 0.1
	2.10-2.20	11.9 ± 0.3	0.72 ± 0.03	0.21 ± 0.01	3.6 ± 0.1	88.2 ± 0.8	0.01 ± 0.00	1.06 ± 0.05	5.8 ± 0.5	1.0 ± 0.5	2.9 ± 0.2
	2.25-2.35	11.7 ± 0.1	0.83 ± 0.08	0.22 ± 0.01	3.5 ± 0.1	96.0 ± 3.5	0.01 ± 0.00	1.18 ± 0.07	6.2 ± 0.8	1.5 ± 0.8	3.3 ± 0.3

^a EP – Epialbic Podzol, ds – driftsand, PA – Plaggic Anthrosol, rEP – relict Entic Podzol, cs - coversand

Supplementary Table 2: Significance of differences between individual depth intervals or complete units, determined for various physical and geochemical parameters as well as root distribution.

Compared depth intervals or units ^a	Parameter	p value ^b
PA (0.4-1.35 m) vs. ds + cs	dry bulk density	0.000001**
	clay	0.00016**
	a*	0.000001**
	L*	0.000001**
	pH	0.038*
	C _{org}	0.000001**
	Na	0.0016**
	K	0.00005**
	Ca	0.00016**
	Mg	0.18
	P	0.00001**
	S	0.000001**
	Cu	0.0006**
	Mo	0.19
lower part of PA (0.9-1.35 m) vs. ds + cs	Mo	0.0012**
top EP (0 m) vs. bottom EP (0.2 m)	L*	0.018*
	a*	0.003**
	pH	0.00018**
top rEP (1.5 m) vs. bottom rEP (1.8 m)	L*	0.00002**
	a*	0.0001**
	pH	0.0004**
bottom EP (0.2 m) vs. bottom ds (0.4 m)	L*	0.58
	a*	0.83
	pH	0.07*
bottom rEP (1.8 m) vs. bottom cs (2.25 m)	L*	0.00007**
	a*	0.0005**
	pH	0.002**
EP (0-0.4 m) vs. ds (0.25-0.4 m)	dry bulk density	0.20
	pH	0.000001**
	C _{org}	0.06*
	P	0.32
	S	0.052*
rEP (1.5-1.8 m) vs. cs (1.95-2.25 m)	dry bulk density	0.000001**
	pH	0.00005**
	C _{org}	0.001**
	P	0.00008**
	S	0.0004**
top EP (0 m) vs. top rEP (1.55 m)	fine root quantities	0.000001**
	medium root quantities	0.000001**

^a EP – Epialbic Podzol, ds – driftsand, PA – Plaggic Anthrosol, rEP – relict Entic Podzol, cs – coversand

^b * significant ($p < 0.1$), ** highly significant ($p < 0.01$)

Supplementary Figure 1: Scatter plots between various physical and geochemical parameters (A-D), as well as between the latter and root frequencies (E-H). Correlations were tested within the PA and for the whole profile, whereas for the root diagrams, the focus was laid on the buried soils and sediments, excluding the EP.

