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Supplement of

Geogenic organic carbon in terrestrial sediments and its contribution to total soil carbon

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Supplementary Material

Figures

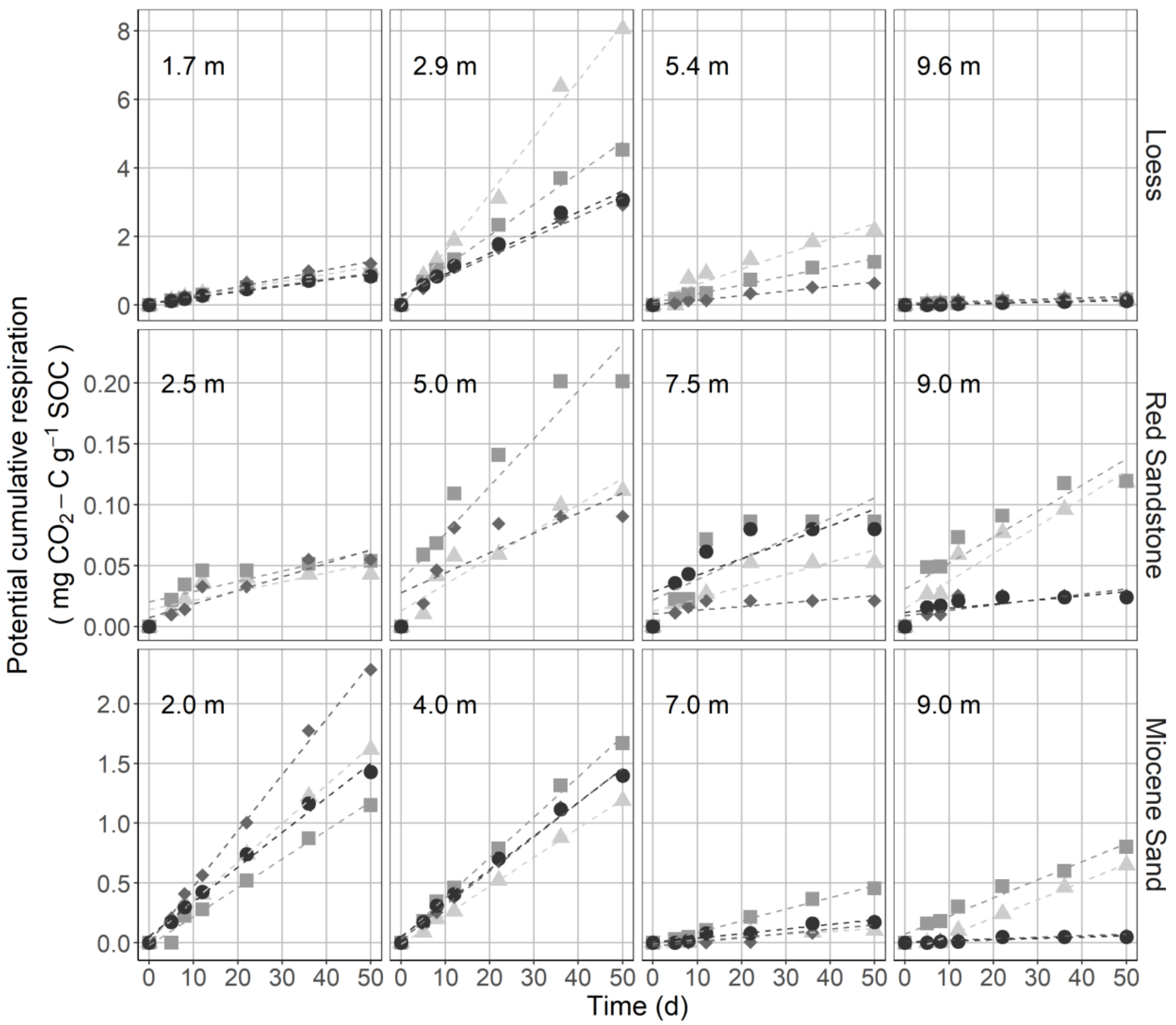

Fig. S1: Potential degradability of sedimentary OC from three sites during the first incubation experiment. Results represent cumulative respiration at 20°C for each of the four repetitions. Dashed lines represent a fitted linear model to the respiration data.

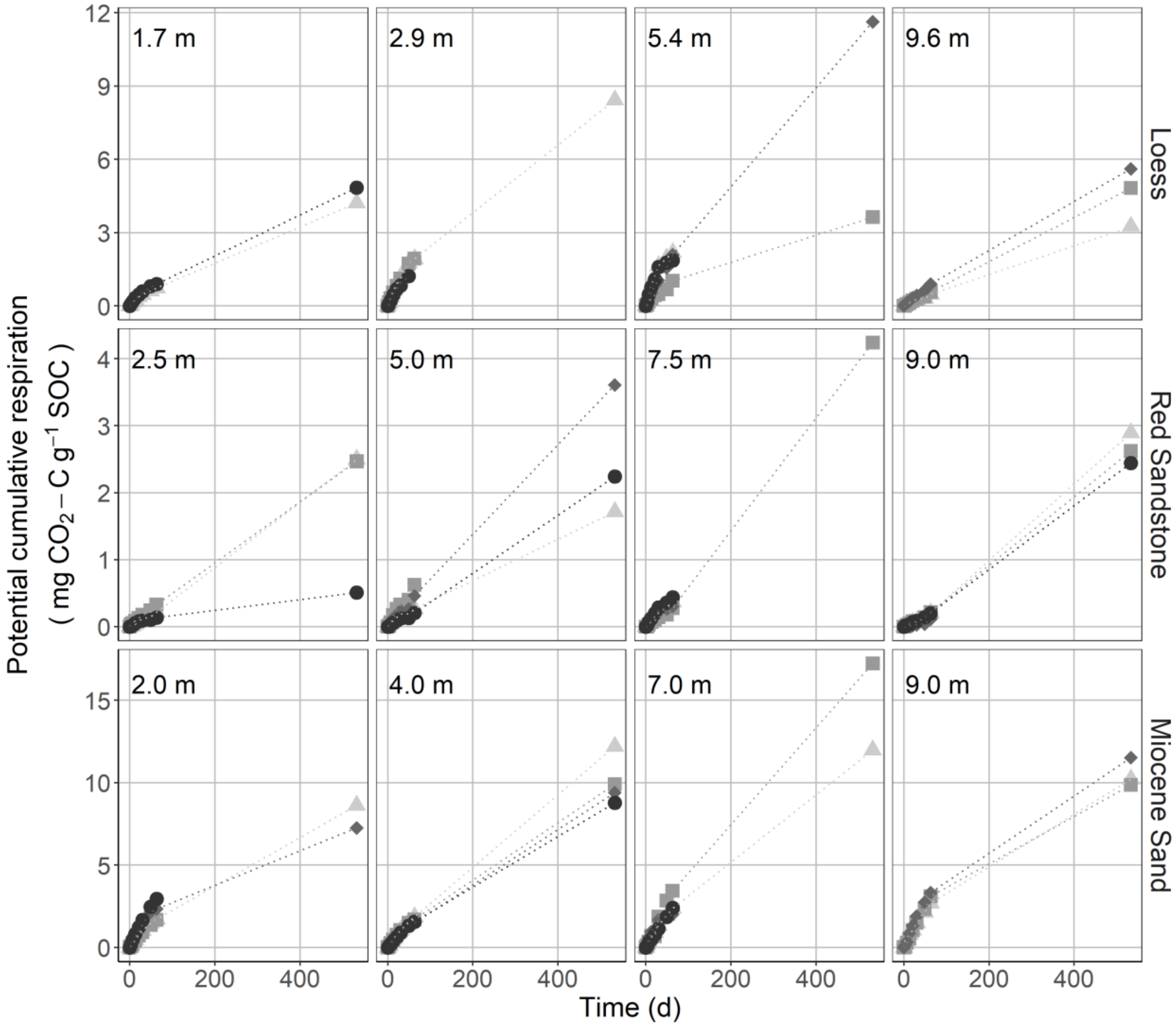

Fig. S2: Potential degradability of sedimentary OC from three sites during the second incubation experiment with crushed Red Sandstone samples with the sample after 533 days included. Results represent cumulative respiration at 20°C for each of the four repetitions. Dashed lines represent the connection for every single repetition.

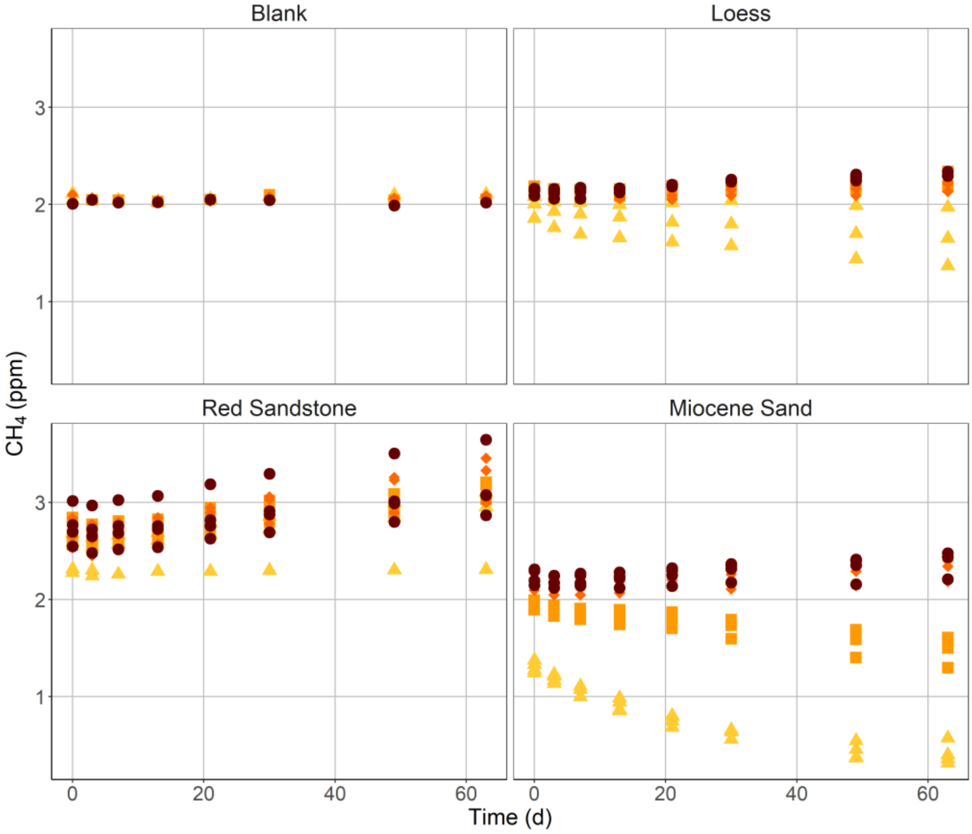

Fig. S3: Potential rates of CH_4 consumption and production during the incubation experiment.

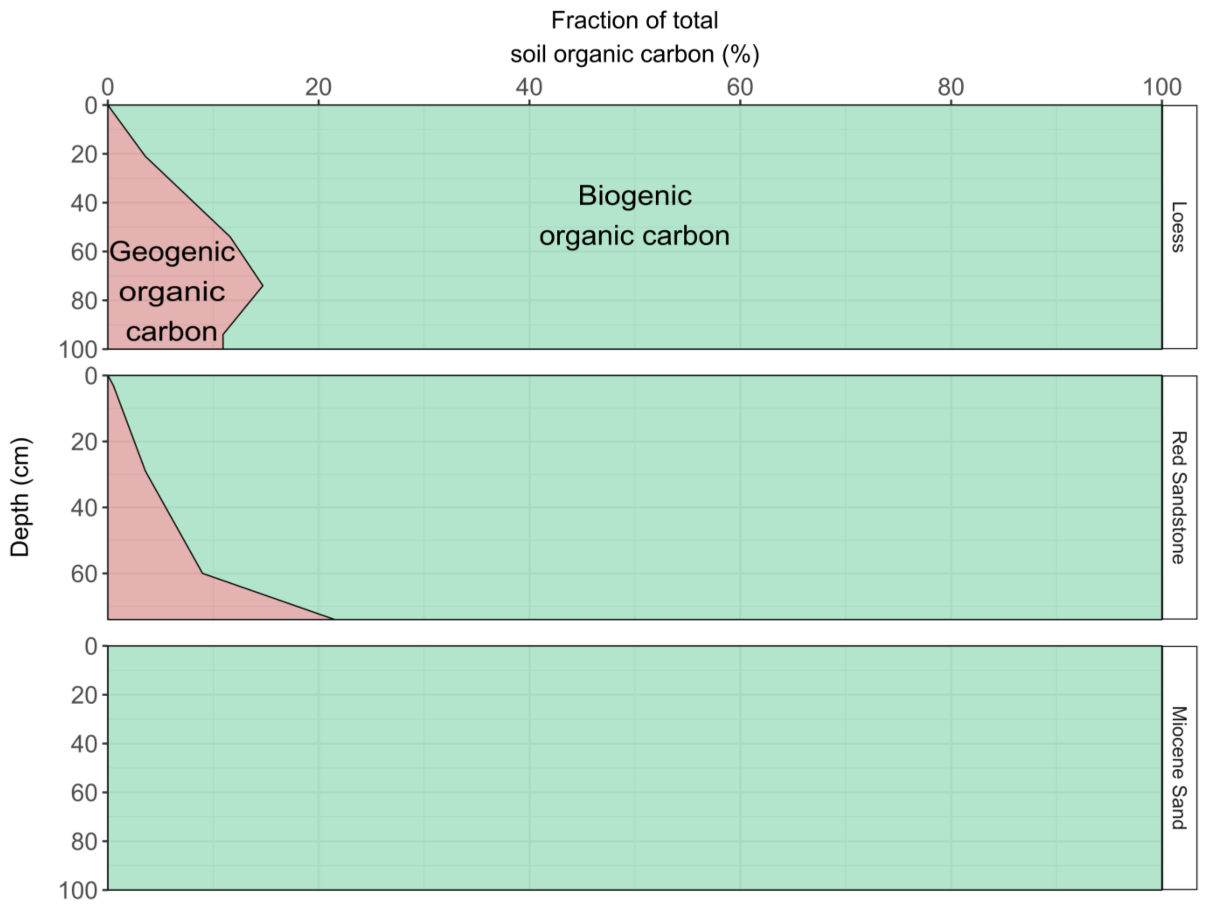

Fig. S4: Highest possible contribution from GOC to OC (red area) in relation to the bulk OC content. Here the GOC contents are based on to the assumption of an average biogenic OC age of 10,000 years.

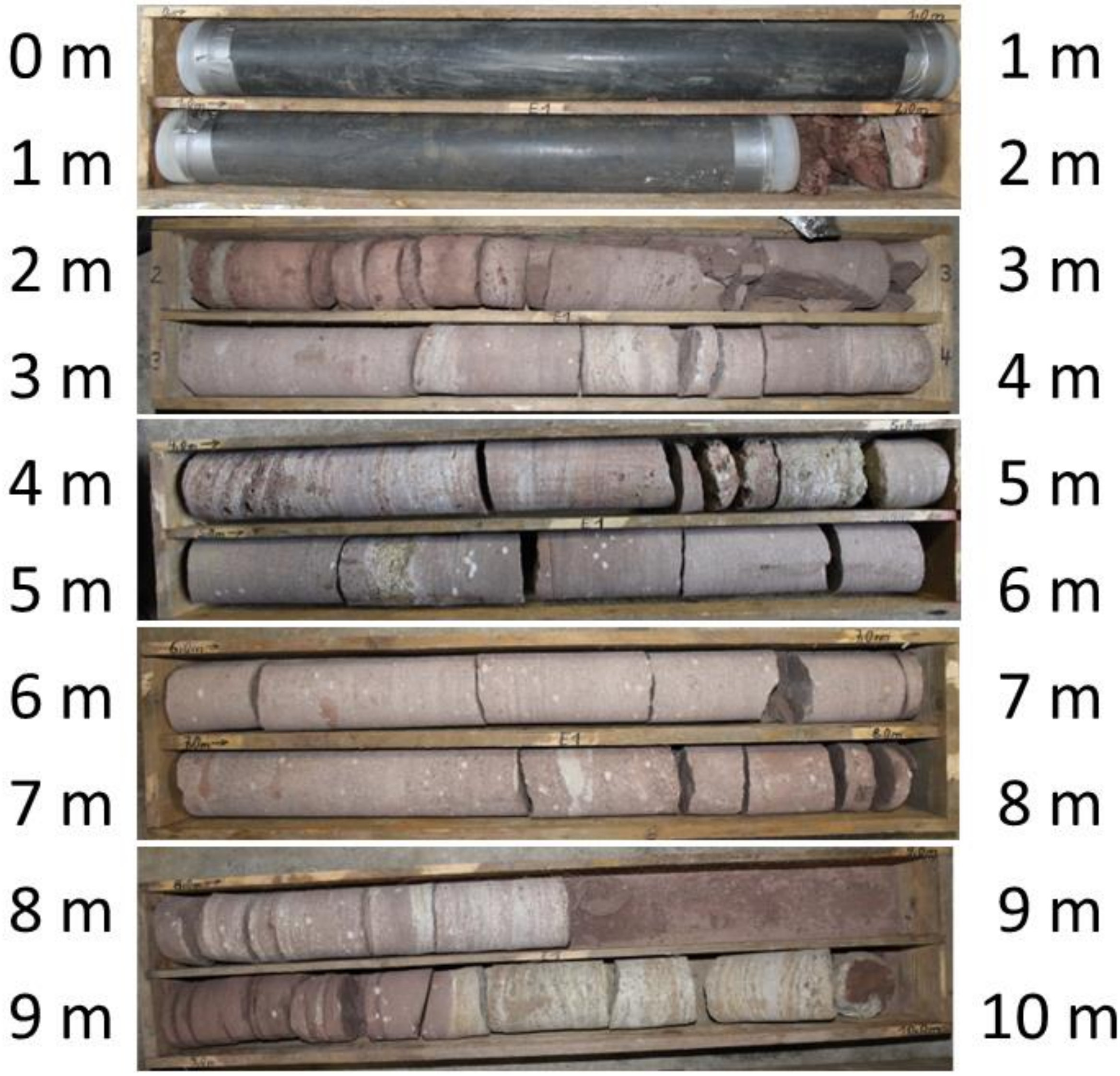

Fig. S5: Core samples from the Red Sandstone down to 10 m depth.

Tables

Table S1: Bulk values for organic carbon (OC), inorganic carbon (IC), nitrogen (N) and calculated ages of the organic part of soil carbon (^{14}C age) and fraction of modern carbon ($F^{14}C$) for each depth increment of the cores and respective samples from the soil profiles. Measurement values are represented as mean values with standard deviations (±) and, if measurements for two cores were available, as a range (-).

Substrate	Depth (m)	OC (g kg^{-1})	IC (g kg^{-1})	N (g kg^{-1})	^{14}C age (yrs BP)	$F^{14}C$
Loess	0.21	9.47	0.31	0.8	0	1.03
	0.54	2.83	0.30	0.24	-	-
	0.74	2.21	0.53	0.26	4,413	0.58
	0.94	3.01	0.10	0.29	-	-
	1.9	2.86 ± 0.04	0.18 ± 0.00	3.06 ± 0.02	2,200	0.76
	2.9	2.62 ± 0.01	0.14 ± 0.00	0.31 ± 0.01	2,730	0.71
	3.9	9.71 ± 0.06	0.41 ± 0.02	0.68 ± 0.00	2,770	0.71
	4.9	1.60 ± 0.06	9.36 ± 0.26	0.17 ± 0.01	13,870	0.18
	5.9	0.25 ± 0.01	0.10 ± 0.00	0.12 ± 0.01	14,720	0.16
	6.9	0.24 ± 0.01	0.09 ± 0.01	0.12 ± 0.00	17,610	0.11
	7.9	0.21 ± 0.02	0.10 ± 0.00	0.11 ± 0.00	30,730	0.02
	8.9	0.38 ± 0.02	0.12 ± 0.00	0.18 ± 0.00	20,410	0.08
	9.9	0.81 ± 0.00	10.72 ± 0.00	0.18 ± 0.01	18,030	0.11
Miocene	0.03	15.87			-	-
	0.17	11.11			-	-
	0.39	15.21			1,277	0.85
	0.61	7.79			1,771	0.80
	0.81	2.35			-	-
	1	0.66			-	-
	1.9	0.50 - 0.71	0.01 - 0.02	0.02 - 0.04	7,710	0.38
	2.9	0.17 - 0.20	0.01 - 0.02	0.01 - 0.02	-	-
	3.9	0.17 - 0.42	0.01 - 0.01	0.02 - 0.02	-	-
	4.9	0.21 - 0.45	0.01 - 0.01	0.02 - 0.04	6,750	0.43
	5.9	0.10 - 0.53	0.01 - 0.01	0.02 - 0.03	-	-
	6.9	0.08 - 0.30	0.00 - 0.02	0.02 - 0.02	-	-
	7.9	0.13 - 0.16	0.00 - 0.00	0.01 - 0.02	12,770	0.20
	8.9	0.16 ± 0.02	0.00 ± 0.00	0.02 ± 0.00	-	-
	9.9	0.04 - 0.10	0.00 - 0.00	0.00 - 0.02	-	-
Red Sandstone	0.03	21.82			0	1.04
	0.29	3.2			532	0.94
	0.6	1.27			-	-
	0.74	0.53			-	-
	0.9	0.05			-	-
	1.9	0.19 - 0.51	0.05 - 0.08	0.25 - 0.27	13,650	0.03

	2.9	0.16 - 0.47	0.26 - 8.03	0.03 - 0.07	-	-
	3.9	0.21 - 0.53	2.29 - 19.90	0.01 - 0.02	-	-
	4.9	0.10 - 0.11	0.00 - 0.46	0.03 - 0.04	13,870	0.14
	5.9	0.02 - 0.14	0.58 - 2.12	0.04 - 0.05	-	-
	6.9	0.01 - 0.18	0.73 - 2.22	0.02 - 0.03	12,940	0.21
	7.9	0.04 - 0.22	2.12 - 4.53	0.01 - 0.05	-	-
	8.9	0.29 - 0.32	0.49 - 5.05	0.08 - 0.10	17,390	0.19
	9.9	0.10 - 0.31	0.40 - 1.30	0.07 - 0.12	-	-
Quarz Control	-	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00		