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*Supplement of*

## **Short-range-order minerals as powerful factors explaining deep soil organic carbon stock distribution: the case of a coffee agroforestry plantation on Andosols in Costa Rica**

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**Table S1 Conventionally measured data of soil organic carbon contents, C/N ratio and bulk density (g cm<sup>-3</sup>)**

Depth	C content (gC kg <sup>-1</sup> soil)		C/N		Bulk density		C stock (Mg C ha <sup>-1</sup> )	
	mean	<i>sd</i>	mean	<i>sd</i>	mean	<i>sd</i>	mean	<i>sd</i>
0-20	62.6	22.9	12.54	1.15	0.71	0.13	73.3	36.7
20-40	51.5	20.9	12.66	1.16	0.73	0.14	53.8	26.8
40-60	41.7	24.4	13.17	1.01	0.79	0.18	49.4	32.3
60-80	33.3	19.9	13.80	1.17	0.79	0.16	42.5	21.3
80-100	31.6	21.3	14.22	1.11	0.83	0.21	49.7	38.9
100-120	27.6	17.9	14.36	1.45	0.88	0.19	37.6	28.4
120-140	24.7	16.3	13.91	2.33	0.92	0.18	36.1	22.4
140-160	19.4	28.2	13.77	1.63	0.94	0.20	30.7	24.7
160-180	18.5	16.3	13.81	2.18	0.96	0.17	39.1	23.9
180-200	18.8	19.2	14.58	1.58	1.01	0.21	46.8	35.1

*n*= 10 for C content, C :N and bulk density until 160-180 cm, *n*=9 for 180-200 cm and *n*=3 for C stocks; *sd*= standard deviation

**Table S2 Conventionally measured data of ammonium oxalate extractable Al, Si, Fe (Al<sub>o</sub>, Si<sub>o</sub>, and Fe<sub>o</sub>) and of sodium pyrophosphate extractable Al, Si, Fe (Al<sub>p</sub>, Si<sub>p</sub> and Fe<sub>p</sub>)**

Depth	Al <sub>o</sub> (g kg <sup>-1</sup> soil)		Al <sub>p</sub> (g kg <sup>-1</sup> soil)		Fe <sub>o</sub> (g kg <sup>-1</sup> soil)		Fe <sub>p</sub> (g kg <sup>-1</sup> soil)		Si <sub>o</sub> (g kg <sup>-1</sup> soil)		Si <sub>p</sub> (g kg <sup>-1</sup> soil)	
	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>
0-20	27.9	16.4	4.4	1.5	13.0	4.6	1.3	0.7	13.4	6.9	5.6	0.3
20-40	27.5	16.1	3.6	1.6	12.7	5.1	0.9	0.6	13.4	6.3	5.5	0.2
40-60	28.3	19.1	3.4	1.3	11.5	5.1	1.0	0.8	14.4	7.4	5.6	0.4
60-80	27.4	19.6	2.7	1.6	11.4	5.4	0.6	0.6	14.5	8.1	5.5	0.2
80-100	26.9	20.2	2.5	1.3	10.4	4.8	0.7	0.9	14.7	8.7	5.5	0.3
100-120	25.3	19.7	2.2	1.1	9.9	4.9	0.5	0.7	14.1	8.4	5.5	0.2
120-140	24.4	20.5	2.1	1.3	9.2	5.2	0.5	0.6	14.1	9.2	5.4	0.2
140-160	21.8	19.6	1.7	1.3	8.4	5.1	0.4	0.5	13.2	8.7	5.5	0.1
160-180	20.2	20.7	1.4	1.0	8.8	5.2	0.1	0.1	12.7	9.4	5.4	0.2
180-200	21.6	21.1	1.5	1.2	9.1	5.0	0.3	0.6	13.2	9.6	5.5	0.1

*n*=10 except for 180-200 cm depth, *m*=mean, *sd*= standard deviation

**Figure S3**

Relationships between SOC content and  $Al_p$  content;  $Al_o + 0.5 Fe_o$ ; allophane content;  $Fe_o$  content; and  $Al:Si$  ratio for the 98 conventionally measured soil samples

