



*Supplement of*

**Soil nutrient contents and stoichiometry within aggregate size classes varied with tea plantation age and soil depth in southern Guangxi in China**

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**Table S1** Effects of soil depth and tea plantation age on the C/N ratio in bulk soil and different sized aggregates.

Soil depth	Tea plantation age	Bulk soil	Different sized aggregates			
			> 2 mm	1-2 mm	0.25-1 mm	< 0.25 mm
0-10 cm	8 years	22.21 ± 0.12 a	21.11 ± 0.13 abB	22.53 ± 0.07 aA	22.05 ± 0.08 aA	21.89 ± 0.08 abB
	17 years	21.72 ± 0.11 a	22.19 ± 0.08 aA	21.00 ± 0.12 aB	21.70 ± 0.11 aB	21.30 ± 0.07 abB
	25 years	22.06 ± 0.06 a	23.04 ± 0.10 aA	21.31 ± 0.08 aB	21.60 ± 0.09 aB	20.81 ± 0.11 bC
	43 years	21.99 ± 0.07 a	22.24 ± 0.11 aA	22.51 ± 0.07 aA	21.61 ± 0.04 aB	21.93 ± 0.09 abB
10-20 cm	8 years	21.73 ± 0.08 a	22.39 ± 0.04 aA	22.09 ± 0.04 aA	21.63 ± 0.09 aB	21.51 ± 0.08 abB
	17 years	21.98 ± 0.08 a	22.97 ± 0.11 aA	22.72 ± 0.09 aA	22.56 ± 0.07 aA	21.12 ± 0.03 abB
	25 years	21.10 ± 0.13 a	21.92 ± 0.07 abB	22.69 ± 0.07 aA	21.90 ± 0.04 aB	20.27 ± 0.07 bC
	43 years	21.47 ± 0.11 a	21.83 ± 0.03 abB	22.55 ± 0.08 aA	21.89 ± 0.10 aB	22.83 ± 0.06 aA
20-40 cm	8 years	18.86 ± 0.13 bc	19.71 ± 0.12 bA	19.05 ± 0.05 bA	18.95 ± 0.12 bcB	17.78 ± 0.02 cdC
	17 years	18.07 ± 0.09 bc	20.21 ± 0.04 abA	18.48 ± 0.11 bcB	18.27 ± 0.04 bcB	18.45 ± 0.13 cB
	25 years	17.52 ± 0.06 c	19.51 ± 0.14 bA	19.29 ± 0.04 bA	19.01 ± 0.07 bA	17.46 ± 0.06 cdB
	43 years	19.38 ± 0.08 b	20.40 ± 0.04 abA	18.71 ± 0.10 bcB	18.03 ± 0.12 bcB	17.56 ± 0.04 cdC
40-60 cm	8 years	18.48 ± 0.04 bc	20.74 ± 0.07 abA	17.47 ± 0.06 cB	17.56 ± 0.13 cB	16.52 ± 0.05 dC
	17 years	18.33 ± 0.09 bc	19.61 ± 0.13 bA	17.69 ± 0.10 cB	17.08 ± 0.06 cB	16.92 ± 0.07 dC
	25 years	19.40 ± 0.04 b	19.67 ± 0.08 bA	16.94 ± 0.05 cC	17.48 ± 0.06 cB	17.03 ± 0.10 cdB
	43 years	18.92 ± 0.05 bc	20.51 ± 0.09 abA	17.27 ± 0.06 cB	17.22 ± 0.05 cB	16.41 ± 0.08 dC

Data represent the mean of 5 replicates ± standard deviations. Means in the same column with the same lower case letter are not significantly different ( $p > 0.05$ ) among different soil depths and tea plantation ages. Means in the same row with the same capital letter are not significantly different ( $p > 0.05$ ) among different sized aggregates.

**Table S2** Effects of soil depth and tea plantation age on the C/P ratio in bulk soil and different sized aggregates.

Soil depth	Tea plantation age	Bulk soil	Different sized aggregates			
			> 2 mm	1-2 mm	0.25-1 mm	< 0.25 mm
0-10 cm	8 years	30.93 ± 1.02 b	32.04 ± 1.04 bA	29.52 ± 1.01 bcAB	31.44 ± 1.27 aAB	28.81 ± 1.01 bB
	17 years	31.63 ± 1.45 b	32.14 ± 0.98 bA	31.48 ± 0.47 bAB	30.46 ± 0.78 aB	30.60 ± 1.07 abB
	25 years	35.94 ± 1.41 a	35.54 ± 1.07 abA	33.54 ± 0.97 abB	30.91 ± 1.08 aC	29.78 ± 0.87 abC
	43 years	34.50 ± 2.89 a	37.07 ± 0.38 aA	36.53 ± 0.81 aA	30.62 ± 0.98 aB	31.00 ± 0.38 aB
10-20 cm	8 years	23.60 ± 0.85 cd	25.93 ± 0.84 cdA	24.76 ± 0.38 cdAB	23.60 ± 0.27 bcB	19.39 ± 1.17 cdC
	17 years	24.18 ± 0.84 c	24.41 ± 1.07 cdB	26.58 ± 0.58 cA	25.38 ± 0.38 bcAB	21.86 ± 0.68 cdC
	25 years	26.28 ± 1.21 bc	27.21 ± 0.37 cA	27.55 ± 0.47 bcA	24.41 ± 1.14 bcB	22.36 ± 0.78 cC
	43 years	26.56 ± 1.47 bc	29.23 ± 0.98 bcA	26.68 ± 0.97 cB	26.41 ± 0.57 bB	23.19 ± 0.98 bcC
20-40 cm	8 years	19.92 ± 0.48 de	22.13 ± 0.97 dA	20.68 ± 1.14 dB	18.96 ± 1.47 cdC	15.22 ± 0.87 deD
	17 years	20.13 ± 0.71 d	21.43 ± 1.12 dA	20.51 ± 1.48 dA	21.62 ± 0.45 cA	17.11 ± 1.14 dB
	25 years	21.15 ± 0.89 cd	26.33 ± 0.86 cdA	21.95 ± 1.05 cdB	19.78 ± 0.87 cdC	17.46 ± 0.94 dD
	43 years	24.41 ± 0.98 c	27.29 ± 1.24 cA	26.07 ± 0.78 cAB	25.60 ± 1.02 bcB	18.50 ± 0.75 cdC
40-60 cm	8 years	17.41 ± 0.69 e	22.40 ± 2.02 dA	16.78 ± 0.87 eB	18.18 ± 0.87 cdB	13.73 ± 0.74 eC
	17 years	17.21 ± 0.58 e	22.88 ± 0.87 dA	18.04 ± 0.98 deB	17.40 ± 0.38 dB	14.50 ± 0.74 deC
	25 years	18.12 ± 0.24 de	22.67 ± 1.24 dA	16.63 ± 1.24 eB	17.43 ± 0.91 dB	13.44 ± 1.00 eC
	43 years	17.59 ± 1.22 e	21.63 ± 1.56 dA	17.55 ± 1.05 deB	17.92 ± 1.34 dB	14.02 ± 0.91 deC

Data represent the mean of 5 replicates ± standard deviations. Means in the same column with the same lower case letter are not significantly different ( $p > 0.05$ ) among different soil depths and tea plantation ages. Means in the same row with the same capital letter are not significantly different ( $p > 0.05$ ) among different sized aggregates.

**Table S3** Effects of soil depth and tea plantation age on the N/P ratio in bulk soil and different sized aggregates.

Soil depth	Tea plantation age	Bulk soil	Different sized aggregates			
			> 2 mm	1-2 mm	0.25-1 mm	< 0.25 mm
0-10 cm	8 years	1.39 ± 0.04 bc	1.52 ± 0.05 abA	1.31 ± 0.03 bB	1.43 ± 0.02 aAB	1.32 ± 0.04 abB
	17 years	1.46 ± 0.02 b	1.45 ± 0.01 bA	1.50 ± 0.01 aA	1.40 ± 0.04 aA	1.44 ± 0.03 aA
	25 years	1.63 ± 0.04 a	1.54 ± 0.04 abA	1.57 ± 0.02 aA	1.43 ± 0.02 aA	1.43 ± 0.02 aA
	43 years	1.57 ± 0.02 ab	1.67 ± 0.02 aA	1.62 ± 0.04 aA	1.42 ± 0.01 aB	1.41 ± 0.04 aB
10-20 cm	8 years	1.09 ± 0.01 d	1.16 ± 0.02 cdA	1.12 ± 0.04 cA	1.09 ± 0.02 cAB	0.90 ± 0.01 bcB
	17 years	1.10 ± 0.04 cd	1.06 ± 0.02 dA	1.17 ± 0.02 cA	1.13 ± 0.01 bcA	1.04 ± 0.02 bcA
	25 years	1.25 ± 0.08 c	1.24 ± 0.03 cA	1.21 ± 0.03 bcA	1.11 ± 0.01 bcA	1.10 ± 0.01 bA
	43 years	1.24 ± 0.03 c	1.34 ± 0.01 bcA	1.18 ± 0.05 cAB	1.21 ± 0.01 bAB	1.02 ± 0.03 bcB
20-40 cm	8 years	1.06 ± 0.02 d	1.11 ± 0.03 cdA	0.98 ± 0.01 dB	0.96 ± 0.06 cB	0.91 ± 0.04 bcB
	17 years	1.11 ± 0.07 cd	1.24 ± 0.02 cA	1.05 ± 0.01 cdAB	1.02 ± 0.02 cAB	0.93 ± 0.02 bcB
	25 years	1.21 ± 0.02 c	1.25 ± 0.05 cA	1.14 ± 0.04 cB	1.13 ± 0.04 bcB	1.00 ± 0.03 bB
	43 years	1.26 ± 0.02 c	1.38 ± 0.04 bcA	1.26 ± 0.02 bcB	1.29 ± 0.03 bB	1.05 ± 0.02 bC
40-60 cm	8 years	0.94 ± 0.06 d	1.08 ± 0.04 dA	0.96 ± 0.06 dAB	0.98 ± 0.04 cAB	0.88 ± 0.03 cB
	17 years	0.99 ± 0.06 d	1.07 ± 0.03 dA	1.02 ± 0.03 cdA	1.02 ± 0.03 cA	0.86 ± 0.04 cB
	25 years	0.93 ± 0.01 d	1.00 ± 0.04 dA	0.98 ± 0.06 dA	0.94 ± 0.02 cAB	0.84 ± 0.02 cB
	43 years	0.98 ± 0.04 d	1.06 ± 0.03 dA	1.03 ± 0.03 cdA	1.04 ± 0.02 cA	0.85 ± 0.04 cB

Data represent the mean of 5 replicates ± standard deviations. Means in the same column with the same lower case letter are not significantly different ( $p > 0.05$ ) among different soil depths and tea plantation ages. Means in the same row with the same capital letter are not significantly different ( $p > 0.05$ ) among different sized aggregates.

**Table S4** Effects of soil depth and tea plantation age on the Ca/Mg ratio in bulk soil and different sized aggregates.

Soil depth	Tea plantation age	Bulk soil	Different sized aggregates			
			> 2 mm	1-2 mm	0.25-1 mm	< 0.25 mm
0-10 cm	8 years	1.94 ± 0.12 a	1.96 ± 0.17 aA	1.94 ± 0.20 aA	1.95 ± 0.14 aA	1.92 ± 0.06 aA
	17 years	1.91 ± 0.05 a	1.89 ± 0.08 abA	1.86 ± 0.17 bA	1.88 ± 0.17 abA	1.85 ± 0.04 bA
	25 years	1.86 ± 0.12 ab	1.88 ± 0.16 abA	1.85 ± 0.08 bAB	1.87 ± 0.06 abAB	1.83 ± 0.08 bB
	43 years	1.82 ± 0.07 b	1.83 ± 0.04 bA	1.84 ± 0.14 bA	1.81 ± 0.07 bA	1.82 ± 0.12 bA
10-20 cm	8 years	1.93 ± 0.08 a	1.92 ± 0.14 aA	1.95 ± 0.15 aA	1.93 ± 0.11 aA	1.94 ± 0.17 aA
	17 years	1.87 ± 0.07 ab	1.87 ± 0.18 abA	1.90 ± 0.16 abA	1.90 ± 0.08 abA	1.86 ± 0.12 abA
	25 years	1.87 ± 0.08 ab	1.86 ± 0.06 abA	1.88 ± 0.08 abA	1.86 ± 0.07 abA	1.87 ± 0.08 abA
	43 years	1.84 ± 0.12 b	1.88 ± 0.07 abA	1.87 ± 0.10 bA	1.84 ± 0.04 bA	1.85 ± 0.07 bA
20-40 cm	8 years	1.96 ± 0.14 a	1.95 ± 0.08 aA	1.92 ± 0.07 aA	1.94 ± 0.12 aA	1.91 ± 0.08 aA
	17 years	1.90 ± 0.14 a	1.88 ± 0.06 abA	1.84 ± 0.05 bA	1.86 ± 0.10 abA	1.85 ± 0.07 bA
	25 years	1.88 ± 0.04 ab	1.89 ± 0.07 abA	1.86 ± 0.12 bAB	1.87 ± 0.03 abAB	1.84 ± 0.07 bB
	43 years	1.80 ± 0.14 b	1.81 ± 0.12 bB	1.85 ± 0.08 bAB	1.82 ± 0.06 bAB	1.86 ± 0.04 abA
40-60 cm	8 years	1.91 ± 0.11 a	1.90 ± 0.11 aA	1.90 ± 0.06 abA	1.92 ± 0.07 aA	1.92 ± 0.11 aA
	17 years	1.88 ± 0.09 ab	1.91 ± 0.09 aA	1.89 ± 0.06 abA	1.90 ± 0.06 abA	1.90 ± 0.03 abA
	25 years	1.90 ± 0.07 a	1.89 ± 0.11 abA	1.88 ± 0.03 abA	1.91 ± 0.05 aA	1.89 ± 0.06 abA
	43 years	1.89 ± 0.06 ab	1.90 ± 0.13 aA	1.89 ± 0.09 abA	1.89 ± 0.09 abA	1.91 ± 0.13 aA

Data represent the mean of 5 replicates ± standard deviations. Means in the same column with the same lower case letter are not significantly different ( $p > 0.05$ ) among different soil depths and tea plantation ages. Means in the same row with the same capital letter are not significantly different ( $p > 0.05$ ) among different sized aggregates.

**Table S5** Effects of soil depth and tea plantation age on the Fe/Mn ratio in bulk soil and different sized aggregates.

Soil depth	Tea plantation age	Bulk soil	Different sized aggregates			
			> 2 mm	1-2 mm	0.25-1 mm	< 0.25 mm
0-10 cm	8 years	0.78 ± 0.04 b	0.77 ± 0.02 bA	0.76 ± 0.01 bA	0.78 ± 0.03 bA	0.79 ± 0.02 bA
	17 years	0.82 ± 0.01 a	0.81 ± 0.01 abA	0.82 ± 0.02 aA	0.82 ± 0.02 aA	0.81 ± 0.03 abA
	25 years	0.81 ± 0.04 ab	0.81 ± 0.03 abA	0.80 ± 0.01 abA	0.82 ± 0.03 aA	0.81 ± 0.03 abA
	43 years	0.84 ± 0.02 a	0.83 ± 0.02 aA	0.85 ± 0.03 aA	0.84 ± 0.01 aA	0.85 ± 0.01 aA
10-20 cm	8 years	0.76 ± 0.02 b	0.75 ± 0.04 bA	0.75 ± 0.02 bA	0.77 ± 0.01 bA	0.77 ± 0.01 bA
	17 years	0.81 ± 0.04 ab	0.80 ± 0.04 abA	0.81 ± 0.01 abA	0.81 ± 0.01 abA	0.82 ± 0.02 abA
	25 years	0.82 ± 0.01 a	0.79 ± 0.01 abA	0.82 ± 0.02 aA	0.82 ± 0.02 aA	0.80 ± 0.01 bA
	43 years	0.83 ± 0.04 a	0.84 ± 0.02 aA	0.84 ± 0.01 aA	0.85 ± 0.02 aA	0.83 ± 0.03 aA
20-40 cm	8 years	0.75 ± 0.03 b	0.77 ± 0.01 bA	0.78 ± 0.02 bA	0.75 ± 0.02 bA	0.78 ± 0.03 bA
	17 years	0.80 ± 0.03 ab	0.78 ± 0.01 bA	0.80 ± 0.03 abA	0.78 ± 0.04 bA	0.80 ± 0.02 bA
	25 years	0.81 ± 0.05 ab	0.82 ± 0.02 aA	0.82 ± 0.01 aA	0.81 ± 0.05 abA	0.82 ± 0.02 abA
	43 years	0.85 ± 0.02 a	0.82 ± 0.03 aA	0.85 ± 0.04 aA	0.84 ± 0.01 aA	0.83 ± 0.04 aA
40-60 cm	8 years	0.78 ± 0.05 b	0.78 ± 0.03 bA	0.79 ± 0.01 abA	0.80 ± 0.04 abA	0.80 ± 0.01 bA
	17 years	0.80 ± 0.05 ab	0.81 ± 0.02 abA	0.82 ± 0.01 aA	0.79 ± 0.02 abA	0.81 ± 0.03 abA
	25 years	0.79 ± 0.03 ab	0.79 ± 0.04 abA	0.81 ± 0.03 abA	0.80 ± 0.02 abA	0.80 ± 0.04 bA
	43 years	0.81 ± 0.03 ab	0.80 ± 0.01 abA	0.82 ± 0.02 aA	0.81 ± 0.03 abA	0.82 ± 0.02 abA

Data represent the mean of 5 replicates ± standard deviations. Means in the same column with the same lower case letter are not significantly different ( $p > 0.05$ ) among different soil depths and tea plantation ages. Means in the same row with the same capital letter are not significantly different ( $p > 0.05$ ) among different sized aggregates.

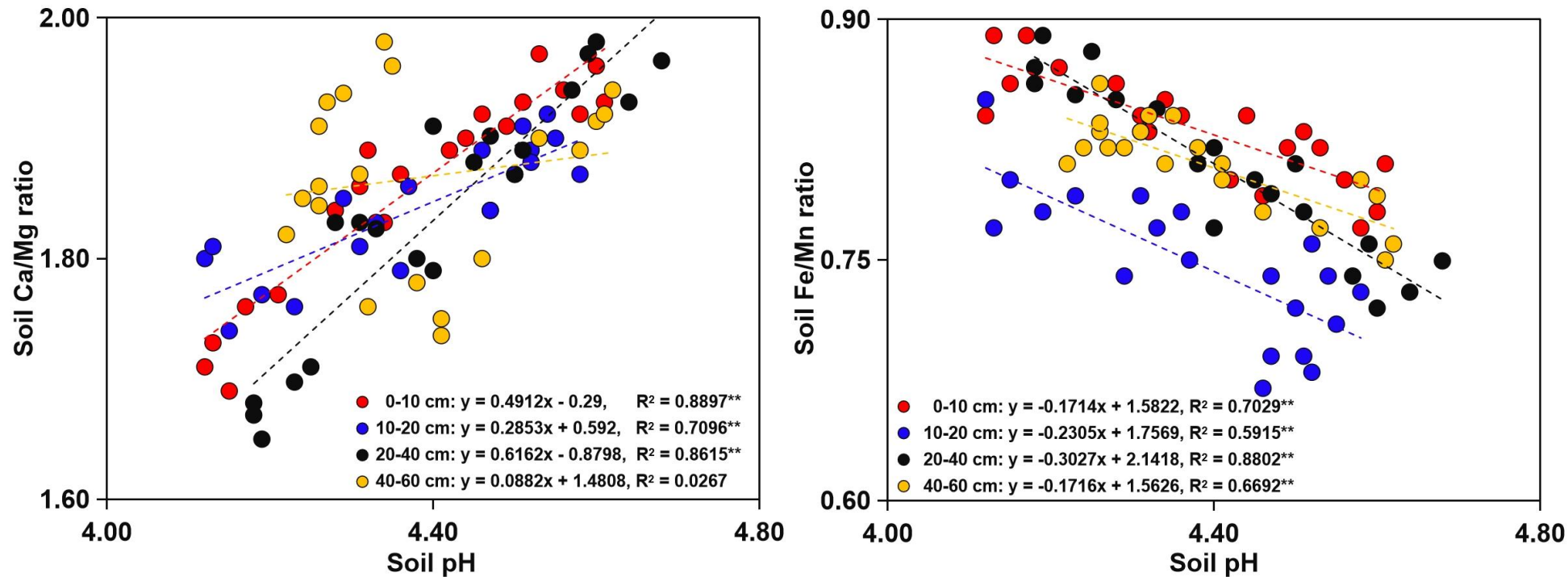


Figure S1 Relationships of soil Ca/Mg and Fe/Mn ratios with soil pH in different soil depths. \*\* indicates significant differences at  $p < 0.01$ .