

## Supplementary Materials

# Conversion of Natural Soil to Paddy Promotes Soil Organic Matter Degradation in Small-Particle Fractions: $\delta^{13}\text{C}$ and Lipid Biomarker Evidence

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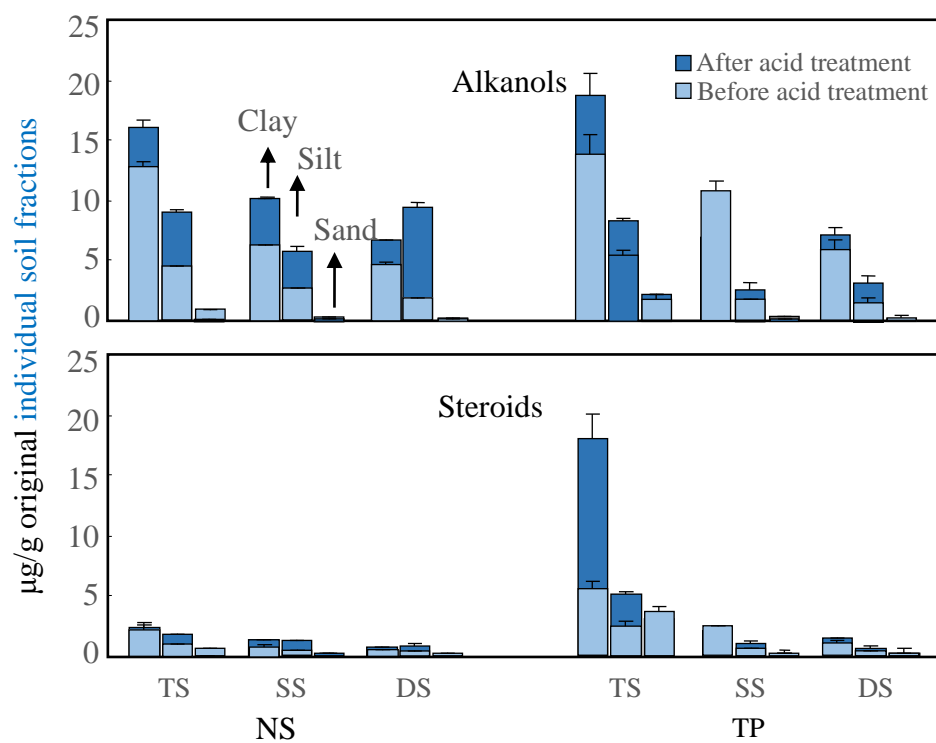
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**Table S1.** The N, H, S content and C/N ratio in SOM before acid treatment

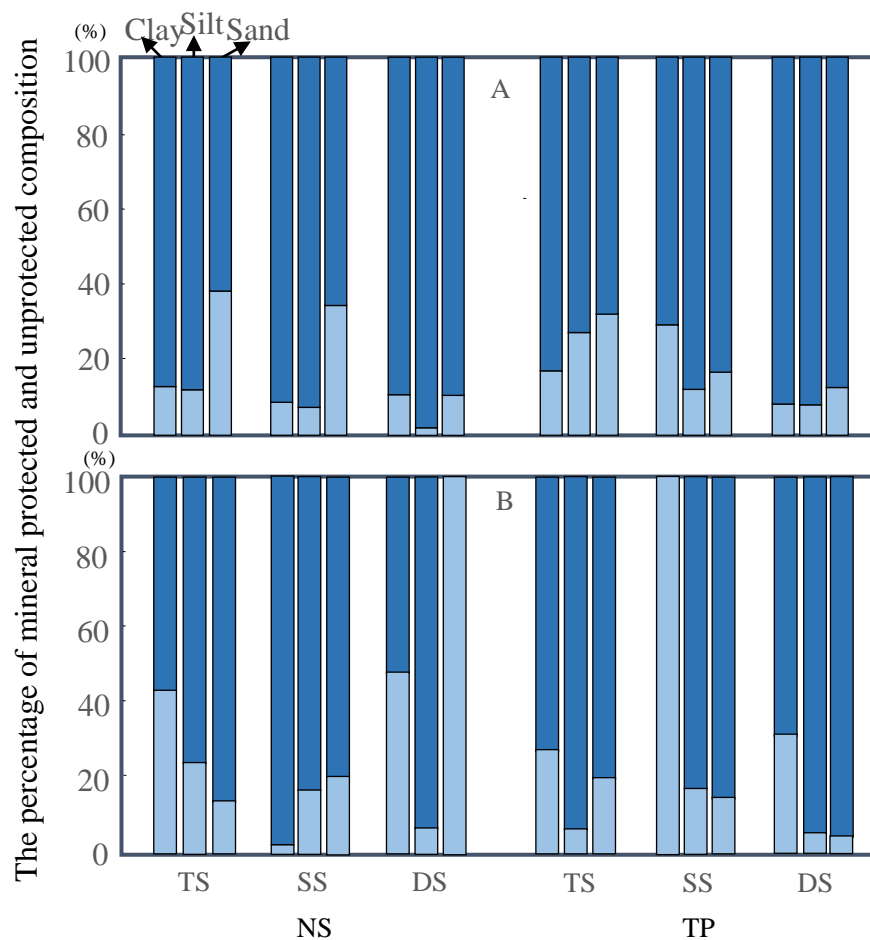
<b>Soil fractions</b>	<b>Samples</b>	<b>N%</b>	<b>H%</b>	<b>S%</b>	<b>C/N</b>
<b>clay</b>	NS-TS	0.21	1.24	0.65	17.88
	NS-SS	0.16	1.1	0.35	18.06
	NS-DS	0.1	1.1	0.49	18.83
	TP-TS	0.17	1.39	0.52	21.45
	TP-SS	0.14	1.02	0.29	15.76
	TP-DS	0.13	0.9	0.29	12.7
<b>silt</b>	NS-TS	0.11	0.67	0.5	31.15
	NS-SS	0.07	0.54	0.29	30.29
	NS-DS	0.03	0.48	0.36	41.17
	TP-TS	0.08	0.69	0.72	32.82
	TP-SS	0.04	0.29	0.41	24.9
	TP-DS	0.05	0.2	0.4	12.31
<b>sand</b>	NS-TS	0.01	0.17	0.44	97.84
	NS-SS	0	0.06	0.16	-
	NS-DS	0	0.05	0.17	-
	TP-TS	0.03	0.28	0.54	43.54
	TP-SS	0.03	0.1	0.36	19.11
	TP-DS	0.04	0.11	0.39	8.95

NS-natural soil, TP-tillage paddy. Soil layers are categorized as TS (0-20 cm), SS (20-40 cm), and DS (40-60 cm).

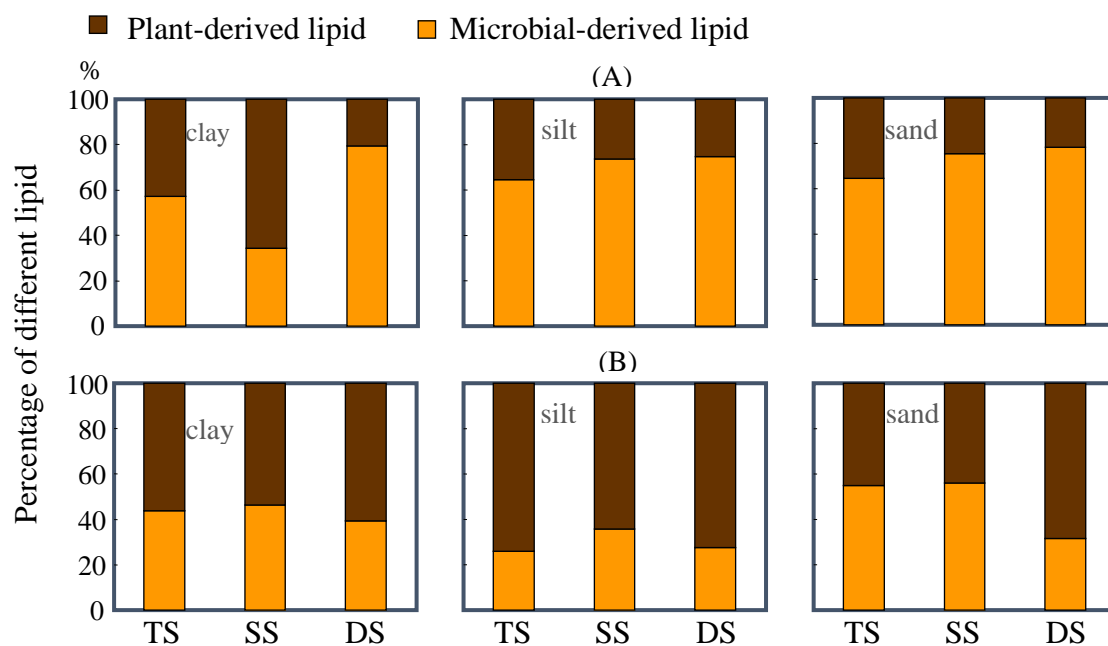


**Figure S1.** The concentration of alkanols and steroids before and after acid treatment.

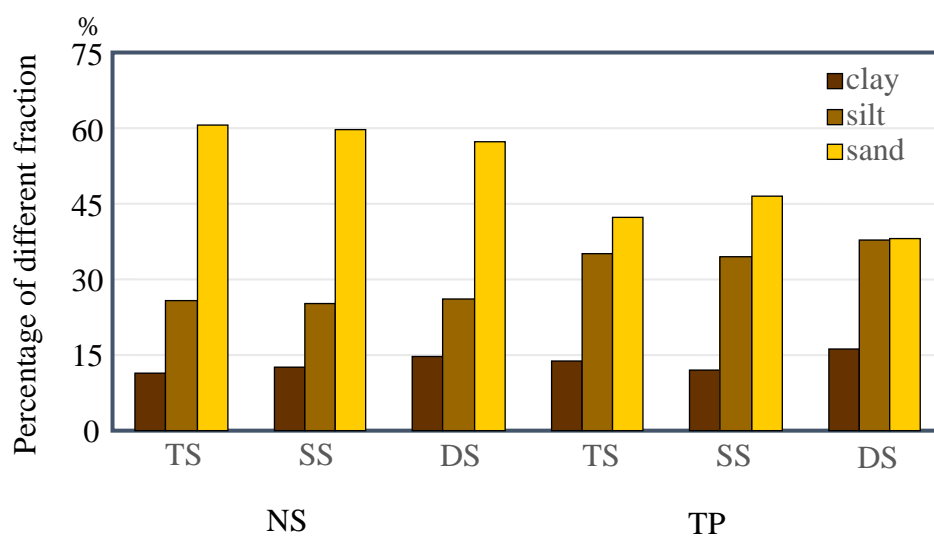
NS-natural soil, TP-tillage paddy. Soil layers are categorized as TS (0-20 cm), SS (20-40 cm), and DS (40-60 cm).



**Figure S2.** The percentage of alkanic acids (A) and alkanes (B) associated with minerals in overall alkanic acids and alkanes detected in different soil fractions. The dark colored columns represented mineral protected composition.



**Figure S3.** The percentage of microbial-derived lipid and plant-derived lipid of different soil size fractions in natural soil (A) and tillage paddy (B). Soil layers are categorized as TS (0-20 cm), SS (20-40 cm), and DS (40-60 cm).



**Figure S4.** The percentage of clay, silt and sand fraction in soils. NS-natural soil, TP-tillage paddy. Soil layers are categorized as TS (0-20 cm), SS (20-40 cm), and DS (40-60 cm).