

Front. Agr. Sci. Eng.

<https://doi.org/10.15302/J-FASE-2024546>

Verso: Front. Agr. Sci. Eng.

Recto: Yujia SHI et al. Optimal organic input for soil organic matter improvement

RESEARCH ARTICLE

Mineralization and humification of chicken manure and composted kitchen waste in soils based on an *in situ* litter-bag experiment: impacts of organic inputs and microbial community

Yujia SHI*, Haixia ZENG*, Linfa FANG, Yue DENG, Ran XIAO (✉)

Interdisciplinary Research Center for Agriculture Green Development in Yangtze River Basin,
College of Resources and Environment, Southwest University, Chongqing 400715, China

*These authors contributed equally to this work.

Received September 24, 2023;

Accepted January 9, 2024.

Correspondence: xiaoran0012@swu.edu.cn

© The Author(s) 2024. Published by Higher Education Press. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0>)

Supplementary materials

Table S1 Parameters of the exponential decay model of organic inputs

Feedstock	k (yr ⁻¹)	R^2	$t_{0.95}$ (yr ⁻¹)
CM	0.48	0.79	6.21
KW	0.47	0.68	6.34

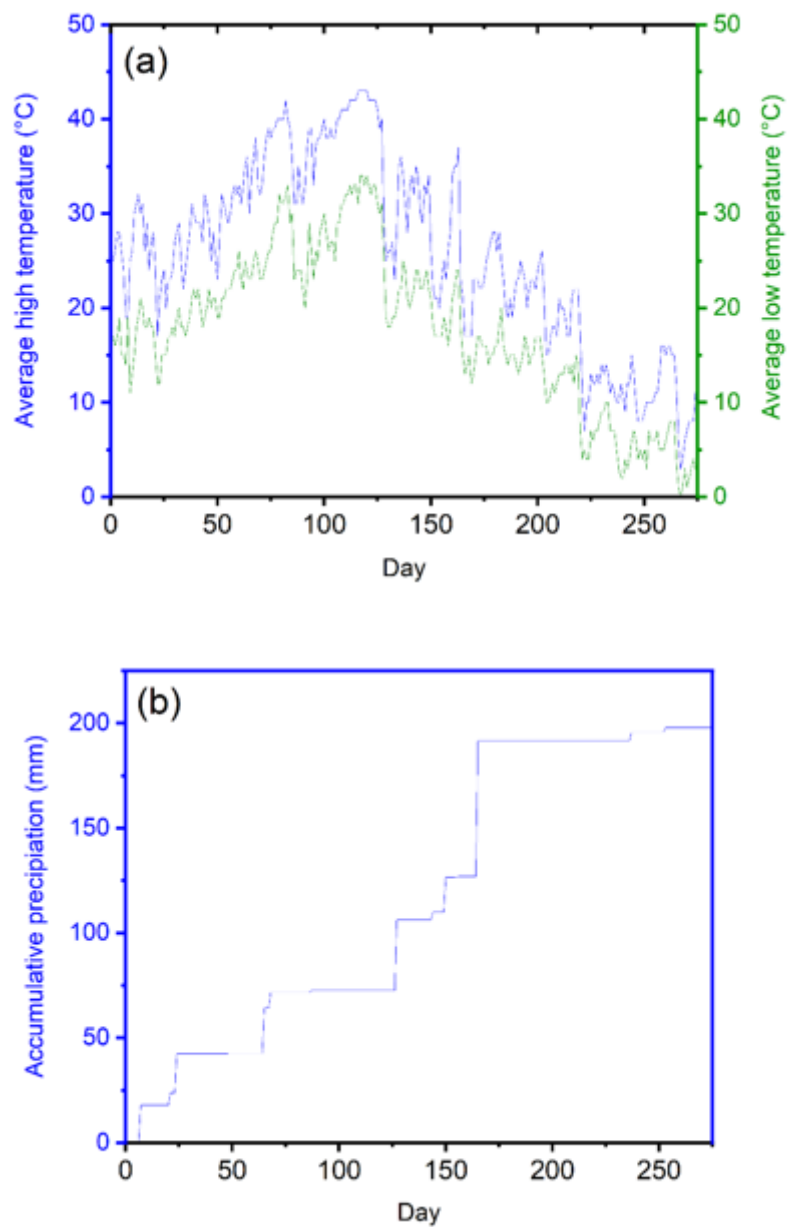


Fig. S1 Changes in the average high and low temperature (a) and accumulative precipitation (b) during the *in-situ* litterbag incubation experiment.

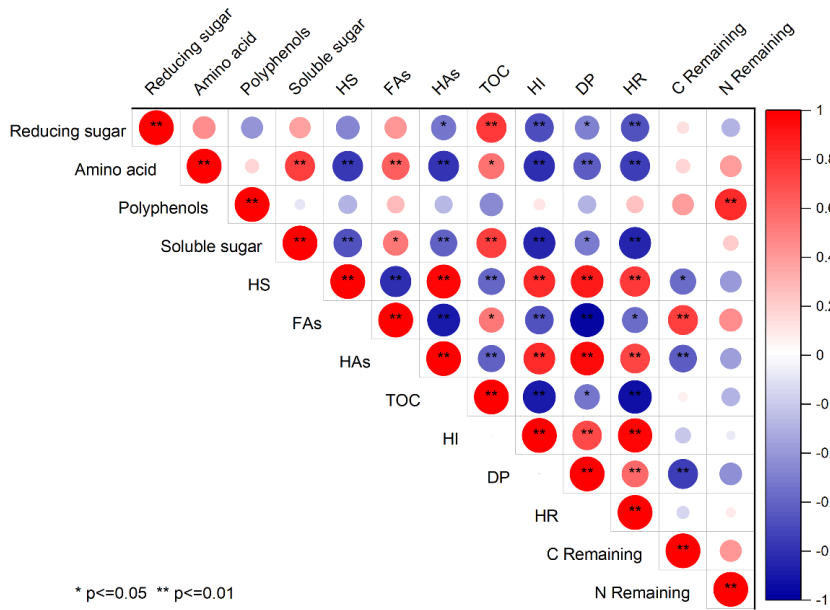


Fig. S2 Pearson correlation between precursors (i.e. reducing sugar, amino acid, polyphenols, and soluble sugar) and HS, HAs, FAs, humification indices (i.e., HI, DP, and HR), and carbon and nitrogen remaining through the *in-situ* litterbag incubation experiment. HI, DP, and HR are humification index, degree of polymerization, and humification ratio.

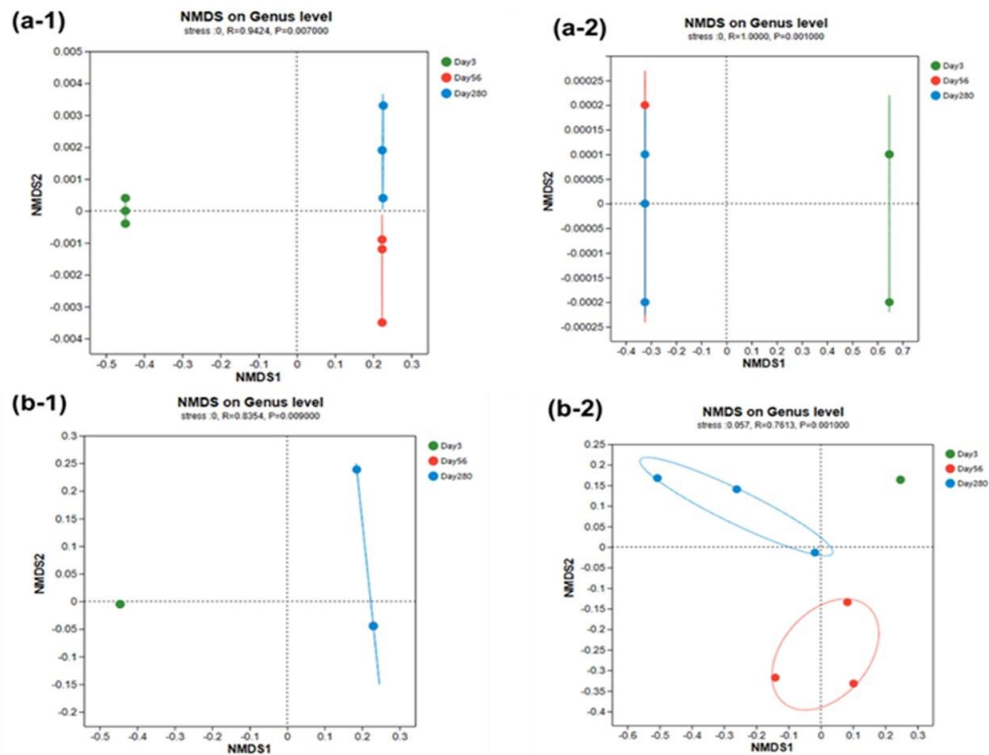


Fig. S3 Non-metric multidimensional scaling (NMDS) analysis of bacterial (a) and fungal (b) communities in different sampling days for CM (a-1, b-1) and KW (a-2, b-2) based on the analysis of similarities (ANOSIM) test.

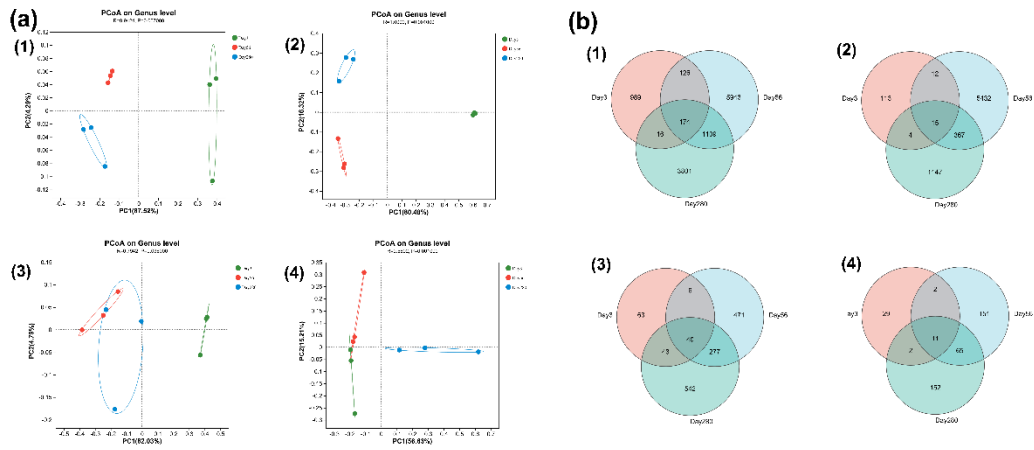


Fig. S4 PCoA analysis of bacterial (a-1, a-2) and fungal (a-3, a-4) community in different sampling days for CM (a-1, a-3) and KW (a-2, a-4), and Venn analysis of bacterial (b-1, b-2) and fungal (b-3, b-4) VAS during litterbag incubation experiment for CM (b-1, b-3) and KW (b-2, b-4).

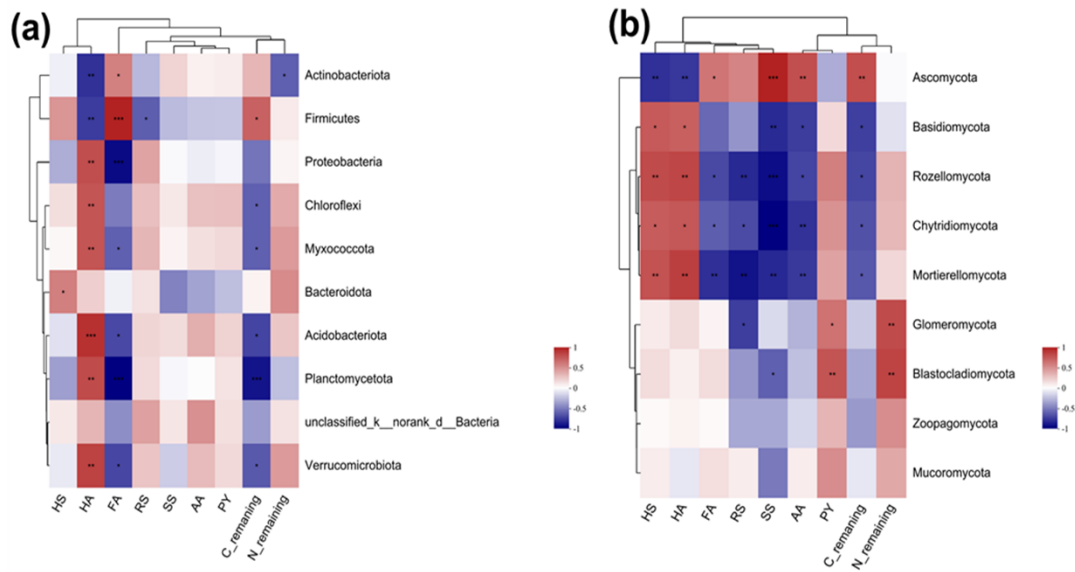


Fig. S5 Correlation analysis based on a heat map of the bacterial (a) and fungal (b) communities (phylum level), levels of humic substances, the precursors of humic substances, and carbon and nitrogen remaining through the litterbag incubation experiment.