

Soil fauna: Tiny but more important than litter mixture during leaf litter decomposition

December 7 2022, by Zhang Nannan



Soil fauna contributes to litter decomposition. Credit: Gbadamassi Dossa

Soil fauna plays an essential role in litter decomposition and their effect on single species litter decomposition has been widely studied. Compared to the separate effects of litter mixing and soil fauna on decomposition, the interactions between litter diversity and soil fauna on

litter decomposition have remained even more elusive.

To address the research gap, researchers from the Xishuangbanna Tropical Botanical Garden (XTBG) and the Wuhan Botanical Garden of the Chinese Academy of Sciences carried out a common garden litter decomposition experiment examining the combined effect of litter species diversity (in short: litter diversity) and soil fauna of different size classes on litter decomposition in the early phase of decomposition.

They tried to answer whether and how the decomposition rates depend on the interactions between litter mixture species composition and soil fauna having access (categorized by size).

Through a 16-month long common garden litter decomposition experiment, the researchers tested the interaction effects using litterbags of three mesh sizes (micromesh, mesomesh, and macromesh) to disentangle the contributions of different fauna groups categorized by their size at Wuhan [botanical garden](#) (subtropical climate).

They demonstrated that soil fauna accelerated the rate of litter decomposition over sixteen months for both [single species](#) litter and litter mixtures. Litter [mass loss](#) was higher in litterbags that allowed meso- and macrofauna access regardless of litter types (single species or multiple species mixtures). Species richness had no significant effect on litter mass loss.



Soil fauna contributes to litter decomposition. Credit: Gbadamassi Dossa

Furthermore, the interaction between [species richness](#) and soil fauna was not significant in modulating litter mass loss in the mixture. Mixing leaf litters from different species resulted in an overall accelerated decomposition rate. The litter mixture effect was reduced as decomposition duration progressed and varied with the mesh size throughout the decomposition period.

"Our results emphasize the importance of soil fauna, decomposition duration and their interactions in shaping [litter](#) mixtures [decomposition](#) outcomes," said Gbadamassi Dossa of XTBG.

The study was published in *Science of The Total Environment*.

More information: Denis Mburu Njoroge et al, Fauna access outweighs litter mixture effect during leaf litter decomposition, *Science of The Total Environment* (2022). [DOI: 10.1016/j.scitotenv.2022.160190](https://doi.org/10.1016/j.scitotenv.2022.160190)

Provided by Chinese Academy of Sciences

Citation: Soil fauna: Tiny but more important than litter mixture during leaf litter decomposition (2022, December 7) retrieved 14 August 2024 from <https://phys.org/news/2022-12-soil-fauna-tiny-important-litter.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.