



Figure S1 Steps taken in a systematic quantitative literature review in meta-analysis

Supporting Information Article list: a list of 81 primary articles from which the data were extracted.

1. Qiu, L.L., Yin, X.Q., Jiang, Y.F., 2019. Contributions of Soil Meso- and Microfauna to Nutrient Release During Broadleaved Tree Litter Decomposition in the Changbai Mountains. *Environmental Entomology* 48(2), 395-403.
2. Carrillo, Y., Ball, B.A., Bradford, M.A., Jordan, C.F., Molina, M., 2011. Soil fauna alter the effects of litter composition on nitrogen cycling in a mineral soil. *Soil Biology and Biochemistry* 43(7), 1440-1449.
3. Bradford, M.A., Tordoff, G.M., Eggers, T., Jones, T.H., Newington, J.E., 2002. Microbiota, fauna, and mesh size interactions in litter decomposition. *Oikos* 99, 317-323.
4. Lin, Y.H., Sun, J.B., Zheng, G.H., Zhang, F.D., Sun, L., Jin, S., 2005. Dynamic Change of Soil Fauna and Its Function on Forest Litter Decomposition at Maoershan Forest Region. *Journal of North-East Forestry University* 6, 33-36. (in Chinese)
5. Mamilov, A.Sh., Byzov, B.A., Zvyagintsev, D.G., Dilly, O.M., 2001. Predation on fungal and bacterial biomass in a soddy-podzolic soil amended with starch, wheat straw and alfalfa meal. *Applied Soil Ecology* 16(2), 131-139.
6. Lin, Y.H., Liu, H.L., Zhang, F.D., Bai, X.L., Wang, B., 2007. Dynamics and Diversity of Soil Fauna Community in Litter Layer of Chinese Fir Forest in Dagangshan Mountain. *Forest Research* 5, 609-614. (in Chinese)
7. He, R.L., Chen, Y.M., Deng, C.C., Yang, W.Q., Zhang, J., Liu, Y., 2015. Seasonal responses of the soil meso- and microfauna to litter decomposition in alpine meadow of western Sichuan. *Chinese Journal of Applied and Environmental Biology* 21(02), 350-357. (in Chinese)
8. Sauvadet, M., Chauvat, M., Fanin, N., Coulibaly, S., Bertrand, I., 2016. Comparing the effects of litter quantity and quality on soil biota structure and functioning: Application to a cultivated soil in Northern France. *Applied Soil Ecology* 107, 261-271.
9. Lekha, A., Chopra, G., Gupta, S.R., 1989. Role of soil fauna in decomposition of rice and sorghum straw. *Proc. Indian Acad. Sci. (Anim. Sci.)* 98, 275-284.
10. Wang, Xingli, Yin, Xiuqin, Song, Bo, Xin, Weidong, Li, Bo, Ma, Hongbin, 2011. Main species litter decomposition and function of soil fauna in *Leymus chinensis* grassland. *Acta Prataculturae Sinica* 20(06), 143-149. (in Chinese)
11. Song, B., 2008. Study on characteristics of soil fauna community and their function in litter decomposition in *Leymus chinensis* steppe, Songnen plain. Northeast Normal University. (in Chinese)
12. Li, X.Q., 2014. Interaction between decomposing litter and soil fauna of the *Betula ermanii* forest floor of the Changbai Mountains, China. Northeast Normal University. (in Chinese)
13. Xin, W.D., 2011. Community Characters and Functional Role in Litter Decomposition of Soil Fauna in Fixed Dune in Songnen Sandy Land. Northeast Normal University. (in Chinese)
14. Li, Y.H., 2012. Decomposition characteristics and soil fauna community dynamics in

- mixed *Eucalyptus grandis* and *Alnus formosana* litters. Sichuan Agricultural University. (in Chinese)
15. Xu, H.J., 2015. Study on soil faunal communities and functions during litter decomposition in three forest types from montane region of eastern Liaoning Province, China. Agricultural University of Hebei. (in Chinese)
 16. Yang, X.D., Yang, Z., Warren, M.W., Chen, J., 2012. Mechanical fragmentation enhances the contribution of Collembola to leaf litter decomposition. *European Journal of Soil Biology* 53, 23-31.
 17. Tresch, S., Frey, D., Le Bayon, R-C., Zanetta, A., Rasche, F., Fliessbach, A., Moretti, M., 2019. Litter decomposition driven by soil fauna, plant diversity and soil management in urban gardens. *Science of The Total Environment* 658, 1614-1629.
 18. Yang, B.L., Zhang, W.W., Xu, H.M., Wang, S.J., Xu, X., Fan, H., Chen, H.Y.H., Ruan, H.H., 2018. Effects of soil fauna on leaf litter decomposition under different land uses in eastern coast of China. *Journal of Forestry Research* 29, 973-982.
 19. Jia, Y.Y., Gu, D.L., Wu, C.W., Yang, W.F., Du, X.F., Wen, T.G., Lv, Y.N., Kong, X.S., Tian, X.J., 2019. Nitrogen deposition slows down the litter decomposition induced by soil macrofauna in the soil of subtropical forests in China. *Ecological Research* 34(3), 360-369.
 20. Fan, H., Wang, S.J., Ruan, H.H., Tan, Y., Zheng, A.B., Xu, Y., Xu, K., Cao, G.H., 2014. Effects of soil fauna on litter decomposition and its community structure under different land use patterns in coastal region of northern Jiangsu province. *Journal of Nanjing Forestry University (Natural Sciences Edition)* 38(03), 1-7. (in Chinese)
 21. Schmidt, A., John, K., Arida, G., Auge, H., Brandl, R., Horgan, F.G., Hotes, S., Marquez, L., Radermacher, N., Settele, J., Wolters, V., Schädler, M., 2015. Effects of Residue Management on Decomposition in Irrigated Rice Fields Are Not Related to Changes in the Decomposer Community. *PLoS ONE* 10(7), e0134402.
 22. Irmiler, U., 2000. Changes in the fauna and its contribution to mass loss and N release during leaf litter decomposition in two deciduous forests. *Pedobiologia* 44(2) 105-118.
 23. Xiong, Y., Liu, Q., Chen, H., Peng, S.L., 2005. Leaf litter decomposition of monsoon evergreen broadleaved forest and dynamics and diversity of soil fauna community in Dinghu Mountain. *Chinese Journal of Ecology* 10, 1120-1126. (in Chinese)
 24. Liu, Y., Wang, L.F., He, R.L., Chen, Y.M., Xu, Z.F., Tan, B., Zhang, L., Xiao, J.J., Zhu, P., Chen, L.H., Guo, L., Zhang, J., 2019. Higher soil fauna abundance accelerates litter carbon release across an alpine forest-tundra ecotone. *Scientific Reports* 9, 10561.
 25. Guille, P., Jordi, S., Dolores, A., Marcos, F.-M., Albert, G.-G., Oriol, G., Joan, L., Olga, M., Laura, M., Romà, O., Ifigenia, U., Elodie A., C., Clément, S., Leandro, V.L., Lore T., V., Andreas, R., Ivan A., J., Josep, P., 2019. Nutrient scarcity strengthens soil fauna control over leaf litter decomposition in tropical rainforests. *Proceedings of the Royal Society B: Biological Sciences* 286, 20191300.
 26. Huang, Y.M., Yang, X., Zhang, D.J., Zhang, J., 2020. The effects of gap size and litter species on colonization of soil fauna during litter decomposition in *Pinus massoniana*

- plantations. *Applied Soil Ecology* 155, 103611.
27. Yin, R., Eisenhauer, N., Auge, H., Purahong, W., Schmidt, A., Schädler, M., 2019. Additive effects of experimental climate change and land use on faunal contribution to litter decomposition. *Soil Biology and Biochemistry* 131, 141-148.
 28. Leclercq-Dransart, J., Santorufo, L., Pernin, C., Louvel, B., Demuynek, S., Grumiaux, F., Douay, F., Leprêtre, A., 2018. Litter breakdown as a tool for assessment of the efficiency of afforestation and ash-aided phytostabilization on metal-contaminated soils functioning in Northern France. *Environmental Science and Pollution Research* 25, 18579-18595.
 29. Patoine, G., Bruelheide, H., Haase, J., Nock, C., Ohlmann, N., Schwarz, B., Scherer-Lorenzen, M., Eisenhauer, N., 2020. Tree litter functional diversity and nitrogen concentration enhance litter decomposition via changes in earthworm communities. *Ecology and Evolution* 10(13), 6752-6768.
 30. Sagi, N., Grünzweig, J.M., Hawlena, D., 2019. Burrowing detritivores regulate nutrient cycling in a desert ecosystem. *Proceedings of the Royal Society B: Biological Sciences* 286, 20191647.
 31. Wang, Z.H., Yin, X.Q., Li, X.Q., 2015. Soil mesofauna effects on litter decomposition in the coniferous forest of the Changbai Mountains, China. *Applied Soil Ecology* 92, 64-71.
 32. Huang, Y.M., Liu, P., Chen, Y.J., Zhang, J., Hu, B.Y., Huang, S.L., Shen, J.L., Xie, W.F., 2016. Contribution of soil fauna to the mass loss of *Trifolium repens* L. litter. *Chinese Journal of Applied and Environmental Biology* 22(04), 654-659. (in Chinese)
 33. Liu, P., 2016. The decomposition of two lawn grass litter and the function of soil fauna. Sichuan Agricultural University. (in Chinese)
 34. Huang, Y.M., Yang, W.Q., Zhang, J., 2015. Process of leaf litter mass loss and the contributions of soil organisms in *Picea aspoerata* plantations of Western Sichuan. *Resources and Environment in the Yangtze Basin* 24(04), 676-683. (in Chinese)
 35. Vreeken-Buijs, M.J., Brussaard, L., 1996. Soil mesofauna dynamics, wheat residue decomposition and nitrogen mineralization in buried litterbags. *Biology and Fertility of Soils* 23, 374-381.
 36. Lin, D.M., Wang, F., Fanin, N., Pang, M., Dou, P.P., Wang, H.J., Qian, S.H., Zhao, L., Yang, Y.C., Mi, X.C., Ma, K.P., 2019. Soil fauna promote litter decomposition but do not alter the relationship between leaf economics spectrum and litter decomposability. *Soil Biology and Biochemistry* 136, 107519.
 37. Paris, C.I., Polo, M.G., Garbagnoli, C., Martínez, P., de Ferré, G.S., Folgarait, P.J., 2008. Litter decomposition and soil organisms within and outside of *Camponotus punctulatus* nests in sown pasture in Northeastern Argentina. *Applied Soil Ecology* 40(2), 271-282.
 38. Jia, Y.Y., Lv, Y.N., Kong, X.S., Jia, X.Q., Tian, K., Du, J.J., Tian, X.J., 2015. Insight into the indirect function of isopods in litter decomposition in mixed subtropical forests in China. *Applied Soil Ecology* 86, 174-181.
 39. Reddy, M.V., Venkataiah, B., 1989. Influence of microarthropod abundance and climatic factors on weight loss and mineral nutrient contents of *Eucalyptus* leaf litter during decomposition. *Biology and Fertility of Soils* 8, 319-324.

40. González, G., Seastedt, T.R., 2001. Soil fauna and plant litter decomposition in tropical and subalpine forests. *Ecology* 82(4), 955-964.
41. Zhang, Y., Zhang, D.J., Li, X., Zhang, J., 2019. Contribution of soil fauna to the degradation of recalcitrant components in *Cinnamomum camphora* foliar litter in different-sized gaps in *Pinus massoniana* plantations. *Journal of Forestry Research* 30, 931-941.
42. Asplund, J., Bokhorst, S., Wardle, D.A., 2013. Secondary compounds can reduce the soil micro-arthropod effect on lichen decomposition. *Soil Biology and Biochemistry* 66, 10-16.
43. Castro-Huerta, R.A., Falco, L.B., Sandler, R.V., Coviella, C.E., 2015. Differential contribution of soil biota groups to plant litter decomposition as mediated by soil use. *PeerJ* 3, e826.
44. Vos, V.C.A., van Ruijven, J., Berg, M.P., Peeters, E.T.H.M., Berendse, F., 2010. Macro-detrivore identity drives leaf litter diversity effects. *Oikos* 120(7), 1092-1098.
45. Yang, X.D., Zou, X.M., 2006. Soil fauna and leaf litter decomposition in tropical rain forest in Xishuangbanna, SW China: effects of mesh size of litterbags. *Chinese Journal of Plant Ecology* 5, 791-801. (in Chinese)
46. Ma, C., Yin, X.Q., Kou, X.C., Wang, Z.H., Li, X.Q., Jiang, Y.F., Wang, H.X., Bernard, E.C., 2019. Effects of Soil Fauna on Cellulose and Lignin Decomposition of Plant Litter in the Changbai Mountain, China. *Environmental Entomology* 48(3), 592-602.
47. Joo, S.J., Yim, M.H., Nakane, K., 2006. Contribution of microarthropods to the decomposition of needle litter in a Japanese cedar (*Cryptomeria japonica* D. Don) plantation. *Forest Ecology and Management* 234, 192-198.
48. Long, J., Zhang, M.J., Zhao, C., Wu, Q.S., Wu, J.N., Huang, B.C., Zhang, J.M., 2019. Effects of soil fauna on element release during litter decomposition in Maolan karst forest. *Chinese Journal of Ecology* 38(09), 2671-2682. (in Chinese)
49. Li, X.Q., Dong, W.H., Song, Y., Wang, W.J., Zhan, W.L., 2019. Effect of Soil Fauna on Home-Field Advantages of Litter Mass Loss and Nutrient Release in Different Temperate Broad-Leaved Forests. *Forests* 10, 1033.
50. Bernaschini, M.L., Moreno, M.L., Pérez-Harguindeguy, N., Valladares, G., 2016. Is litter decomposition influenced by forest size and invertebrate detritivores during the dry season in semiarid Chaco Serrano? *Journal of Arid Environments* 127, 154-159.
51. Yang, X., Shao, M.A., Li, T.C., 2020. Effects of terrestrial isopods on soil nutrients during litter decomposition. *Geoderma* 376, 114546.
52. Song, X.X., Wang, Z.K., Tang, X.L., Xu, D.L., Liu, B.T., Mei, J.H., Huang, S.L., Huang, G., 2020. The contributions of soil mesofauna to leaf and root litter decomposition of dominant plant species in grassland. *Applied Soil Ecology* 155, 103651.
53. Xiao, L., Ma, Y.T., Gan, Z.W., Cai, R.F., Li, Z.L., Ge, G., Wu, L., 2020. Influence of soil fauna on the litter decomposition of Lake Poyang Wetland in winter. *Journal of Lake Sciences* 32(02), 395-405. (in Chinese)
54. Zhang, L., 2018. Community structure of soil fauna and its effects on leaf litter

- decomposition under nitrogen deposition. Nanjing Forestry University. (in Chinese)
55. Guo, C.H., 2019. Effects of soil fauna on leaf litter decomposition in a subalpine forest: an experimental comparison between biocide and litterbag methods. Sichuan Agricultural University. (in Chinese)
 56. Yu, Q., 2015. Effect of different micro-sites and soil fauna on litter decomposition in an alpine swamp meadow of the Tibetan Plateau. Lanzhou University. (in Chinese)
 57. Wang, W.J., 2014. Contributions of soil fauna to litter decomposition in ropical evergreen broad-leaved forests in Sichuan Basin. Sichuan Agricultural University. (in Chinese)
 58. Liu, R.L., 2014. Effects of soil fauna on litter decomposition in the subalpine and alpine forests of Western Sichuan, China. Sichuan Agricultural University. (in Chinese)
 59. Xia, L., 2012. Contribution of Soil Fauna to Litter Decomposition in the Alpine/Subalpine Forests. Sichuan Agricultural University. (in Chinese)
 60. Wang, S.J., 2009. Effects of Soil Fauna on Leaf Litter Decomposition along an Elevation Gradient in the Wuyi Mountains. Nanjing Forestry University. (in Chinese)
 61. Wang, L.F., Zhang, J., He, R.L., Chen, Y.M., Yang, L., Zheng, H.F., Li, H.J., Xiao, J.J., Liu, Y., 2018. Impacts of soil fauna on lignin and cellulose degradation in litter decomposition across an alpine forest-tundra ecotone. *European Journal of Soil Biology* 87, 53-60.
 62. Araujo, P.I., Yahdjian, L., Austin, A.T., 2012. Do soil organisms affect aboveground litter decomposition in the semiarid Patagonian steppe, Argentina? *Oecologia* 168, 221-230.
 63. Wang, Z.H., Yin, X.Q., Zhang, C.M., 2016. Effects of Soil Fauna Communities on Decomposition of *Abies nephrolepis* Litter in Changbai Mountains. *Scientia Silvae Sinicae* 52(07), 59-67. (in Chinese)
 64. Smith, V.C., Bradford, M.A., 2003. Litter quality impacts on grassland litter decomposition are differently dependent on soil fauna across time. *Applied Soil Ecology* 24(2), 197-203.
 65. Hättenschwiler, S., Gasser, P., 2005. Soil animals alter plant litter diversity effects on decomposition. *PNAS* 102(5), 1519-1524.
 66. Çakır, M., Makineci, E., 2020. Litter decomposition in pure and mixed *Quercus* and *Fagus* stands as influenced by arthropods in Belgrad Forest, Turkey. *Journal of Forestry Research* 31, 1123-1137.
 67. Melguizo-Ruiz, N., Jiménez-Navarro, G., De Mas, E., Pato, J., Scheu, S., Austin, A.T., Wise, D.H., Moya-Laraño, J., 2019. Field exclusion of large soil predators impacts lower trophic levels and decreases leaf-litter decomposition in dry forests. *Journal of Animal Ecology* 89(2), 334-346.
 68. Cárcamo, H.A., Prescott, C.E., Chanway, C.P., Abe, T.A., 2001. Do soil fauna increase rates of litter breakdown and nitrogen release in forests of British Columbia, Canada?. *Canadian Journal of Forest Research* 31(7), 1195-1204.
 69. Vossbrinck, C.R., Coleman, D.C., Woolley, T.A., 1979. Abiotic and Biotic Factors in Litter Decomposition in a Sermiarid Grassland. *Ecology* 60(2), 265-271.

70. Zimmer, M., Kautz, G., Topp, W., 2005. Do woodlice and earthworms interact synergistically in leaf litter decomposition? *Functional Ecology* 19(1), 7-16.
71. Frouz, J., 2008. The effect of litter type and macrofauna community on litter decomposition and organic matter accumulation in post-mining sites. *Biologia* 63(2), 249-253.
72. Peña-Peña, K., Irmiler, U., 2018. Nitrogen and carbon losses from decomposing litter in natural and agroecosystems of two different climate regions of Brazil. *European Journal of Soil Biology* 86, 26-33.
73. Tan, B., Wu, F.Z., Yang, W.Q., Xu, Z.F., Zhang, L., Liu, Y., 2015. Soil Fauna Significantly Contributes to Litter Decomposition at Low Temperatures in the Alpine/Subalpine Forests. *Polish Journal of Ecology* 63(3), 377-386.
74. Zhou, S.X., Butenschoen, O., Barantal, S., Handa, I.T., Makkonen, M., Vos, V., Aerts, R., Berg, M.P., McKie, B., Van Ruijven, J., Hättenschwiler, S., Scheu, S., 2020. Decomposition of leaf litter mixtures across biomes: The role of litter identity, diversity and soil fauna. *Journal of Ecology* 108(6), 2283-2297.
75. Zan, P., Sun, T., Mao, Z., 2021. Effects of soil fauna on litter decomposition using field microcosms across 16 co-occurring temperate tree species. *Australian Forestry* 84(1), 33-38.
76. Milcu, A., Manning, P., 2011. All size classes of soil fauna and litter quality control the acceleration of litter decay in its home environment. *Oikos* 120(9), 1366-1370.
77. Wang, S.J., Ruan, H.H., Han, Y., 2010. Effects of microclimate, litter type, and mesh size on leaf litter decomposition along an elevation gradient in the Wuyi Mountains, China. *Ecological Research* 25, 1113-1120.
78. Peng, Y., Yang, W.Q., Li, J., Wang, B., Zhang, C., Yue, K., Wu, F.Z., 2015. Contribution of Soil Fauna to Foliar Litter-Mass Loss in Winter in an Ecotone between Dry Valley and Montane Forest in the Upper Reaches of the Minjiang River. *PLoS ONE* 10(4), e0124605.
79. Zhao, B., Xiao, J.J., Zhou, K.L., Liao, Y.X., Zhou, H.Y., Zhang, J., 2015. Characteristics of soil fauna community in the decomposition of *Deyeuxia arundinacea* litters. *Chinese Journal of Applied and Environmental Biology* 21(05), 940-947. (in Chinese)
80. Giebelmann, U.C., Martins, K.G., Brändle, M., Schädler, M., Marques, R., Brandl, R., 2010. Diversity and ecosystem functioning: Litter decomposition dynamics in the Atlantic Rainforest. *Applied Soil Ecology* 46(2), 283-290.
81. Bao, J.L., 2013. Study on contribution of soil fauna to litter decomposition of *Rhododendron chrysanthum* in *Betula ermanii* forest on Changbai Mountain. Northeast Normal University. (in Chinese)