

REFERENCES

- Aerts. R., & O. Honnay. 2011. Forest restoration, biodiversity and ecosystem functioning. *BMC Ecology*, 11, 29. <https://doi.org/10.1186/1472-6785-11-29>
- Aira. M., F. Monroy., & J. Domínguez. (2007). Earthworms strongly modify microbial biomass and activity triggering enzymatic activities during vermicomposting independently of the application rates of pig slurry. *Science of The Total Environment*, 385(1–3), 252–261. <https://doi.org/10.1016/j.scitotenv.2007.07.031>
- Alam. S., Lisnawati, L. M. H. Kilowasid., Darwis, Asniah, & A. Nurmas. (2015). Role of epigeic earthworms on trophic group of nematodes during organic matter decomposition in litter bags under tomato cropping on Ultisol. *AIP Conference Proceedings*, 1677(1), 110012. <https://doi.org/10.1063/1.4930783>
- Anderson. J. M., & J. S. I. Ingram. (1993). *Tropical soil biology and fertility: A handbook of methods* (2nd ed.). CAB International
- Banerjee. S., & M. G. A. van der Heijden. (2023). Soil microbiomes and One Health. *Nature Reviews Microbiology*, 21(1), 6–20. <https://doi.org/10.1038/s41579-022-00779-w>
- Bender. S. F., C. Wagg., & M. G. A. van der Heijden. (2016). An underground revolution: Biodiversity and soil ecological engineering for agricultural sustainability. *Trends in Ecology & Evolution*, 31(6), 440–452. <https://doi.org/10.1016/j.tree.2016.02.016>
- Bittelli. M. (2011). Measuring soil water content: A review. *HortTechnology*, 21(3), 293–300. <https://doi.org/10.21273/HORTTECH.21.3.293>
- Blouin. M., M. E. Hodson., E. A. Delgado., G. Baker., L. Brussaard., K. R. Butt., & P. Lavelle. (2013). A review of earthworm impact on soil function and ecosystem services. *European Journal of Soil Science*, 64(2), 161–182. <https://doi.org/10.1111/ejss.12025>
- Bot. A., & J. Benites. (2005). *The importance of soil organic matter: Key to drought-resistant soil and sustained food production*. Food and Agriculture Organization of the United Nations.
- Bottinelli. N., & Y. Capowiez. (2020). Earthworm ecological categories are not functional groups. *Biology and Fertility of Soils*, 57, 329–331. <https://doi.org/10.1007/s00374-020-01517-1>
- Brady. N. C., & E. R. Weil. (2008). *The nature and properties of soils* (14th ed.). Pearson Prentice Hall.
- Briones. M. J. I. (2014). Soil fauna and soil functions: A jigsaw puzzle. *Frontiers in Environmental Science*, 2, Article 7. <https://doi.org/10.3389/fenvs.2014.00007>

- Briones. M. J. I., & O. Schmidt. (2017). Conventional tillage decreases the abundance and biomass of earthworms: A meta-analysis. *Global Change Biology*, 23(10), 4396–4419. <https://doi.org/10.1111/gcb.13744>
- Decaëns, T. (2010). Macroecological patterns in soil communities. *Global Ecology and Biogeography*, 19(3), 287–302. <https://doi.org/10.1111/j.1466-8238.2009.00517.x>
- Domínguez, J. (2018). Earthworms and vermicomposting. In C. A. M. Lavelle & A. D. H. Curry (Eds.), *Earthworms – The ecological engineers of soil* (Chap. 4). IntechOpen. <https://www.intechopen.com/chapters/60445>
- Duffy JE: Why biodiversity is important to the functioning of real-world ecosystems. *Front Ecol Environ* 2009, 7(8):437-444.
- Edwards. W. M., M. J. Shipitalo., L. B. Owens., & L. D. Norton. (1990). *Effect of Lumbricus terrestris burrows on hydrology of continuous no-till corn fields*. *Geoderma*, 46(1–3), 73–84. [https://doi.org/10.1016/0016-7061\(90\)90008-W](https://doi.org/10.1016/0016-7061(90)90008-W)
- Eisenhauer. N., A. Bonn., & C. A. Guerra. (2019). Recognizing the quiet extinction of invertebrates. *Nature Communications*, 10(1), 50. <https://doi.org/10.1038/s41467-018-07916-1>
- Encyclopedia of the Environment. (2020). *Soil biodiversity*. Retrieved from <https://www.encyclopedie-environnement.org/en/soil/soil-biodiversity/>
- Ernst. G., D. Felten., M. Vohland., & C. Emmerling. (2009). *Impact of ecologically different earthworm species on soil water characteristics*. *European Journal of Soil Biology*, 45(3–4), 207–213. <https://doi.org/10.1016/j.ejsobi.2009.01.001>
- FAO & ITPS. (2015). *Status of the World's Soil Resources (SWSR) – Main Report*. Food and Agriculture Organization of the United Nations and Intergovernmental Technical Panel on Soils. <https://www.fao.org/3/i5199e/I5199E.pdf>
- Forestry Agency. 2003. *The Ministry of Agriculture, Forestry and Fisheries of Japan*. Annual Report on Trends of Forest and Forestry, Tokyo, 230, (in Japanese)
- Global Forest Watch. (2020). *Tosashimizu, Kōchi, Japan forest data dashboard*. World Resources Institute. <https://www.globalforestwatch.org/dashboards/country/JPN/20/30/?category=fires>
- Gómez-Brandón. M., M. Lores., & J. Domínguez. (2012). Species-specific effects of epigeic earthworms on microbial community structure during first stages of decomposition of organic matter. *PLoS ONE*, 7(2), e31895. <https://doi.org/10.1371/journal.pone.0031895>
- Gupta. V. V. S. R. (1997). Soil fauna and soil structure. *Australian Journal of Soil Research*, 35(4), 761–775. <https://doi.org/10.1071/S96042>

- Ghosh. S. K. (2013). Role of Arthropods in Maintaining Soil Fertility. *Agriculture*, 3(4), 629–639. <https://doi.org/10.3390/agriculture3040629>
- Hallam. J., & M. E. Hodson. (2020). *Impact of different earthworm ecotypes on water stable aggregates and soil water holding capacity*. *Biology and Fertility of Soils*, 56(6), 607–617. <https://doi.org/10.1007/s00374-020-01432-5>
- Hale. C.M., L.E. Frelich, P.B. Reich, and J. Pastor. (2005). Effects of European earthworm invasion on soil characteristics in northern hardwood forest of Minnesota USA. *Ecosystem*. 8: 911-927.
- International Organization for Standardization. (2017). *ISO 14688-1: Geotechnical investigation and testing – Identification and classification of soil – Part 1: Identification and description*.
- Johnston. A. S. A. (2019). *Land management modulates the environmental controls on global earthworm communities*. *Global Ecology and Biogeography*, 28(12), 1787–1795. <https://doi.org/10.1111/geb.12992>
- Józefowska. A., K. Woźnica., J. Sokołowska., A. Sochan., T. Zaleski., M. Ryżak., & A. Bieganowski. (2021). Stability of aggregates made by earthworms in soils with organic additives. *Agronomy*, 11(3), 421. <https://doi.org/10.3390/agronomy11030421>
- Kawaguchi. T., N. Iwashima., T. Masunaga., T. Hiura., & N. Kaneko. (2011). The role of epigeic Japanese earthworms in soil aggregation in forest soil: A long-term field experiment. *Edaphologia*, 88, 19–30. https://doi.org/10.18936/edaphologia.88.0_19
- Lavelle. P., & A. V. Spain. (2001). *Soil Ecology*. Springer.
- Lavelle, P., & Spain, A. V. (1997). Faunal activities and soil processes: Adaptive strategies that determine ecosystem function. *Advances in Ecological Research*, 27, 93–132. [https://doi.org/10.1016/S0065-2504\(08\)60007-0](https://doi.org/10.1016/S0065-2504(08)60007-0)
- Lavelle. P., T. Decaëns., M. Aubert., S. Barot., M. Blouin., F. Bureau., ... & J.P Rossi. (2006). Soil invertebrates and ecosystem services. *European Journal of Soil Biology*, 42, S3–S15. <https://doi.org/10.1016/j.ejsobi.2006.10.002>
- Lehmann. A., W. Zheng., & M. C. Rillig. (2017). Soil biota contributions to soil aggregation. *Nature Ecology & Evolution*, 1(12), 1828–1835. <https://doi.org/10.1038/s41559-017-0344-y>
- Li. M., Y. Liu., Q. Zhao., & J. Zhang. (2022). Effects of earthworm (*Metaphire guillelmi*) addition on soil aggregate organic carbon content and clover root characteristics. *Authorea*. <https://doi.org/10.22541/au.166142621.22414662/v1>
- Liu. X., X. Wu., G. Liang., F. Zheng., M. Zhang., & S. Li. (2021). A global meta-analysis of the impacts of no-tillage on soil aggregation and aggregate-

associated organic carbon. *Land Degradation & Development*, 32(18), 5292–5305. <https://doi.org/10.1002/ldr.4109>

Lowery, B., W. J. Hickey., M. Arshad., & R. Lal. (1996). *Soil water parameters and soil quality*. In J. W. Doran & A. J. Jones (Eds.), *Methods for assessing soil quality* (pp. 143–155). Soil Science Society of America. <https://doi.org/10.2136/SSASPECPUB49.C8>

Medina-Sauza, R. M., M. Álvarez-Jiménez., A. Delhal., F. Reverchon., M. Blouin., J. A. Guerrero-Analco., C. R. Cerdán., R. Guevara., L. Villain., & I. Barois. (2019). Earthworms building up soil microbiota: A review. *Frontiers in Environmental Science*, 7, 81. <https://doi.org/10.3389/fenvs.2019.00081>

Morffi-Mestre, H., G. Ángeles-Pérez., J. S. Powers., J. L. Andrade., R. E. Feldman., F. May-Pat., F. Chi-May., J. M. Dupuy-Rada., & M. Martínez-Ramos. (2023). *Leaf litter decomposition rates: Influence of successional age, topography and microenvironment on six dominant tree species in a tropical dry forest*. *Frontiers in Forests and Global Change*, 6, 1082233. <https://doi.org/10.3389/ffgc.2023.1082233>

Muchane, M. T., P. Pypers., J. Six., B. Vanlauwe., & J. J. Lelei. (2018). Impact of arbuscular mycorrhizal fungi and earthworms on water-stable aggregation in pigeonpea systems. *Soil Research*, 57(1), 53–65. <https://doi.org/10.1071/SR18067>

Nielsen, U. N., E. Ayres., D. H. Wall., & R. D. Bardgett. (2011). Soil biodiversity and carbon cycling: A review and synthesis of studies examining diversity–function relationships. *European Journal of Soil Science*, 62, 105–116. <https://doi.org/10.1111/j.1365-2389.2010.01314.x>

Ojha, R. B., & D. Devkota. (2014). Earthworms: Soil and ecosystem engineers – a review. *World Journal of Agricultural Research*, 2(6), 257–260. <https://doi.org/10.12691/wjar-2-6-1>

Orgiazzi, A., R. D. Bardgett., E. Barrios., V. Behan-Pelletier., J. L. Chotte., G. B. De Deyn., ... & F. Moreira. (2016). *Global Soil Biodiversity Atlas*. European Commission, Publications Office of the European Union. <https://esdac.jrc.ec.europa.eu/content/global-soil-biodiversity-atlas>

Patil, S. R., & P. M. H. Biradar. (2019). Production of worm biomass (vermi protein) and vermicompost by using epigeic earthworms. *International Journal of Zoological Investigations*, 5(2), 245–252.

Qiu, J. P. (2000). *Earthworms and environmental protection* [蚯蚓与环境保护]. *Guizhou Science*, 18, 116–133. (In Chinese with English abstract).

Rasmussen, T. C. (2019). *Soil water*. In P. A. Maurice (Ed.), *Encyclopedia of Water: Science, Technology, and Society* (Vol. 3). John Wiley & Sons. <https://doi.org/10.1002/9781119300762.wsts0111>

Remelli, R., E. Petrella., D. Capolongo., G. Colangelo., P. Lollino., A. Rossi., M. Bianchi., & F. Greco. (2019). *Hydrodynamic and soil biodiversity*

characterization in an active landslide. Water, 11(9), 1882.
<https://doi.org/10.3390/w11091882>

Rossi. J. P., M. Blouin., & P. Lavelle. (2021). Soil fauna as ecosystem engineers and bioindicators. In D. J. Eldridge & T. R. Bardgett (Eds.), *Soil Ecology and Ecosystem Services* (2nd ed., pp. 219–239). Oxford University Press.

Six. J., H. Bossuyt., S. Degryze., & K. Denef. (2004). A history of research on the link between (micro)aggregates, soil biota, and soil organic matter dynamics. *Soil & Tillage Research, 79(1), 7–31.*
<https://doi.org/10.1016/j.still.2004.03.008>

Šrut. M. (2022). *Environmental epigenetics in soil ecosystems: Earthworms as model organisms. Toxics, 10(7), 406.*
<https://doi.org/10.3390/toxics10070406>

Suryaningtyas. D. T., R. Widyastuti., & A. S. Sirait. (2024). *The diversity and abundance of soil mesofauna on lime post-mining land in Padalarang, West Bandung. Jurnal Pengelolaan Lingkungan Pertambangan, 1(1), 12–20.* <https://doi.org/10.70191/jplp.v1i1.54413>

Van Groenigen. J. W., I. M. Lubbers., H. M. J. Vos., G. G. Brown., G.B. De Deyn., & K. J. van Groenigen. (2014). Earthworms increase plant production: a meta-analysis. *Scientific Reports, 4, 6365.*
<https://doi.org/10.1038/srep06365>

Velasco. M. Á., M. J. Rodríguez., & J. Domínguez. (2013). Selective feeding of the earthworm *Hormogaster elisae* (Oligochaeta: Hormogastridae) in natural and laboratory conditions. *Pedobiologia, 56(2), 75–81.*
<https://doi.org/10.1016/j.pedobi.2013.01.002>

Wanderlog. (n.d.). *Takamatsu weather in August: Average temperature & climate.* Retrieved July 5, 2025, from <https://wanderlog.com/weather/120/8/takamatsu-weather-in-august>

Wang. J., W. Zhang., C. Huang., & X. Xie. (2016). Estimating the influence of related soil properties on macro- and micro-aggregate stability in Ultisols of south-central China. *Catena, 137, 545–553.*
<https://doi.org/10.1016/j.catena.2015.11.001>

Wasis. B., B. Winata., & N. U. Safaaturrohmah. (2023). *Kelimpahan fauna tanah dan hubungannya dengan karakteristik tapak pada vegetasi submontana di Taman Nasional Gunung Gede Pangrango.* *Jurnal Silvikultur Tropika, 14(3), 201–208.* <https://repository.ipb.ac.id/handle/123456789/110000>

Weather Atlas. (n.d.). *Takamatsu, Japan – Climate and weather by month.* Retrieved July 5, 2025, from <https://www.weather-atlas.com/en/japan/takamatsu-climate>

Widyastuti, R., Djajakirana, G., & Yusnizar, A. N. (2021). *Relationship of abundance and diversity of soil fauna with land position in the toposequence of Pangrango Mount, Bogor.* IPB University.

Yu. X., Y. Zhang., Z. Cao., & J. Li. (2022). Revisiting soil water potential: Towards a better understanding of soil-plant-atmosphere continuum. *Water, 14(22), 3721.* <https://doi.org/10.3390/w14223721>

- Zhang. D., G. Liu., H. Zhou., & Y. Wang. (2020). Effects of earthworm burrowing on soil physical and hydraulic properties: A review. *Sustainability*, 12(21), 9303. <https://doi.org/10.3390/su12219303>
- Zhang. Z., L. Sheng., J. Yang., X. Chen., L. Kong., & B. Wagan. (2015). *Effects of land use and slope gradient on soil erosion in a red-soil hilly watershed of southern China*. *Sustainability*, 7(10), 14309–14325. <https://doi.org/10.3390/su71014309>
- Zhang. B., & S. Schrader. (1993). Earthworm effects on soil structure and physical properties. *Biology and Fertility of Soils*, 17(3), 251–256. <https://doi.org/10.1007/BF00361617>
- Zhao. X., H. Zhou., X. Zhang., & Y. Wang. (2023). Responses of soil fauna community under changing environmental conditions. *Journal of Arid Land*, 15(3), 324–339. <https://doi.org/10.1007/s40333-023-0009-4>