

EDITORIAL

German biodiversity assessment goes below ground***Christian Wirth^{1,2,a}, Helge Bruelheide^{1,3}, Nina Farwig⁴, Jori Marx², Julia S. Ellerbrok⁴ and Josef Settele^{1,5}**¹ German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Leipzig, Germany² Systematic Botany and Functional Biodiversity, Leipzig University, Leipzig, Germany³ Institute of Biology / Geobotany and Botanical Garden, Martin Luther University Halle-Wittenberg, Halle, Germany⁴ Conservation Ecology, University of Marburg, Marburg, Germany⁵ Department of Conservation Biology and Social-Ecological Systems, Helmholtz Centre for Environmental Research (UFZ), Halle, Germany^a Corresponding author, e-mail: cwirth@uni-leipzig.de

Received 24 March 2025 | Accepted 24 March 2025

Published online at www.soil-organisms.org 1 April 2025 | Printed version 15 April 2025DOI <https://doi.org/10.25674/465>

* This paper is part of the special collection 'Faktencheck Artenvielfalt'

We are living in times of rapid change and multiple crises. One of the most concerning is the biodiversity crisis. This refers to the global loss of biological diversity caused by us humans: the disappearance of habitats, the rapid change in biotic communities, the shrinking of animal and plant populations, their genetic impoverishment and ultimately their extinction. As a consequence, the functioning and service provisioning of ecosystems also change, often for the worse. These interrelationships were impressively summarised for our planet in the report of the World Biodiversity Council (IPBES 2019). But how does the biodiversity crisis manifest itself in Germany and what are the reasons for these changes? What are the consequences for our ecosystems and thus for our livelihoods? What about our efforts to protect and promote biodiversity? And what are our options to raise awareness and thus to initiate a transformation to an economy with and for biodiversity?

Despite the importance of these issues, there has been no representative and long-term recording of biodiversity and its influencing drivers in Germany to date. Nor is there any systematic recording of the service provisioning of our ecosystems or the success of conservation measures. At the same time, hardly any other country conducts as much research and surveys on biodiversity as Germany - in universities, research institutions, societies and associations. Scientific breakthroughs in recent decades have generated a flood of new data and findings that can make an important contribution to the conservation practice of biodiversity. And still, a lack of awareness and interest has led to a lack of data and knowledge for certain groups of organisms. This is very prominent for soil biodiversity.

Over 50% of the world's terrestrial species spend at least part of their lives in the soil. Although numerous surveys and reports have analyzed the state of biodiversity, ecosystems and their services in recent years, a specific focus

* Christian Wirth, Helge Bruelheide, Nina Farwig, Jori Maylin Marx, Josef Settele (eds.): Faktencheck Artenvielfalt. oekom verlag, 2024. (ISBN: 978-3-98726-095-7, <https://doi.org/10.14512/9783987263361>)



Figure 1. The German biodiversity assessment “Faktencheck Artenvielfalt” (Wirth et al. 2024a).

on soil biodiversity has often been lacking and is often not taken into account by decision-makers when it comes to the designation of conservation areas. This fact is of particular concern because soil biodiversity plays a crucial role in the provision of many important ecosystem services. Soil harbors a wide diversity of organisms - from micro- to macroorganisms and from terrestrial to aquatic organisms - which has hampered previous efforts to develop a satisfactory

understanding of how biodiversity is distributed in soil, and what the main drivers of this diversity are.

The German biodiversity assessment “Faktencheck Artenvielfalt” (Wirth et al. 2024a, Wirth et al. 2024b; soon available in English) brought together more than 150 authors from a wide range of scientific and practical disciplines to address such knowledge gaps (Fig. 1).

After the assessment’s initial publication on October 1st 2024 (Fig. 2), twenty-one authors have once again joined forces to shed light on the current state of knowledge on various aspects of soil biodiversity, based on the authors’ expert knowledge and extensive literature research in German and English. Particular emphasis is placed on the role of soil organisms for essential ecosystem functions and services. Important drivers of soil biodiversity changes are identified. Conservation measures are evaluated in their effect on soil biodiversity. Finally, the role of different actor groups and the importance of education in initiating a transformative change towards more awareness and conservation effort for soil biodiversity are discussed. With this special collection of Soil Organisms (in this and the next couple of issues), the experts of the “Faktencheck Artenvielfalt” take it into their hands to promote the importance of soil biodiversity research



Figure 2. The importance of soil biodiversity was presented to a large audience as part of the festive publication event of the German biodiversity assessment “Faktencheck Artenvielfalt” in Berlin in autumn 2024.

not only for Germany but as a basis for formulating international policy goals for maintaining soil biodiversity.

References

- IPBES – Intergovernmental Science-Policy Platform On Biodiversity And Ecosystem Services (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. <https://doi.org/10.5281/zenodo.3831673>
- Wirth, C., Bruelheide, H., Farwig, N., Marx, J. M., & Settele, J. (2024a). Faktencheck Artenvielfalt. Bestandsaufnahme und Perspektiven für den Erhalt der biologischen Vielfalt in Deutschland. oekom science. <https://www.oekom.de/9783987260957>
- Wirth, C., Bruelheide, H., Farwig, N., Marx, J. M., & Settele, J. (2024b). Faktencheck Artenvielfalt. Bestandsaufnahme und Perspektiven für den Erhalt der biologischen Vielfalt in Deutschland. oekom science. ZUSAMMENFASSUNG für die gesellschaftliche Entscheidungsfindung. <https://doi.org/10.14512/9783987263378>

