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Soil invertebrate fauna enhances grassland succession and diversity

Gerlinde B. De Deyn , Ciska E. Raaijmakers, H. Rik Zoomer, Matty P. Berg, Peter C. de Ruiter, Herman A. Verhoef, T. Martijn Bezemer & Wim H. van der Putten

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Abstract

One of the most important areas in ecology is to elucidate the factors that drive succession in ecosystems and thus influence the diversity of species in natural vegetation. Significant mechanisms in this process are known to be resource limitation^{1,2,3} and the effects of aboveground vertebrate herbivores^{4,5}. More recently, symbiotic and pathogenic soil microbes have been shown to exert a profound effect on the composition of vegetation^{6,7,8,9} and changes therein^{10,11}. However, the influence of invertebrate soil fauna on succession has so far received little attention^{12,13}. Here we report that invertebrate soil fauna might enhance both secondary succession and local plant species diversity. Soil fauna from a series of secondary grassland succession stages selectively suppress early successional dominant¹⁴ plant species, thereby enhancing the relative abundance of subordinate¹⁴ species and also that of species from later succession stages. Soil fauna from the mid-succession stage had the strongest effect. Our results clearly show that soil fauna strongly affects the composition of natural vegetation and we suggest that this knowledge might improve the restoration and conservation of plant species diversity.

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Author information

Affiliations

1. Department of Multitrophic Interactions, Centre for Terrestrial Ecology, Netherlands Institute of Ecology (NIOO-KNAW), P.O. Box 40, Heteren, 6666 ZG, The Netherlands

Gerlinde B. De Deyn, Ciska E. Raaijmakers, T. Martijn Bezemer & Wim H. van der Putten

2. Department of Animal Ecology, Institute of Ecological Science, Vrije Universiteit De Boelelaan 1085, 1081 HV, Amsterdam, The Netherlands

H. Rik Zoomer, Matty P. Berg & Herman A. Verhoef

3. Department of Environmental Sciences, Copernicus Research Institute for Sustainable Development and Innovation, Utrecht University, P.O. Box 80115, 3508 TC, Utrecht, The Netherlands

Peter C. de Ruiter

Corresponding author

Correspondence to [Gerlinde B. De Deyn](#).

Ethics declarations

Competing interests

The authors declare that they have no competing financial interests.

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