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A matter of perspective: habitat niche width below-ground

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A matter of perspective: habitat niche width below-ground

Carmen Vazquez, Ron de Goede, Gerard Korthals, Michiel Rutgers, Ton Schouten & Rachel Creamer

It is the case in many systems that with human intervention, species become locally extinct. Moreover, species that depend on specific habitats to survive (habitat specialists) are more likely to become extinct than those that can survive in multiple habitats (habitat generalists).

But the number of habitats that a species can inhabit is difficult to quantify. What qualifies as a habitat? How different must two places be to be considered different habitats? It becomes even harder to calculate this number for organisms that live in the soil, because soils are known to be very complex systems. Another way to quantify specialisation looks into how similar communities are to one another: a species that is always surrounded by the same group of species is likely a specialist; a species that occurs in varied communities will likely be a generalist.

We calculated these values for soil-dwelling nematodes and then calculated how specialised the nematode community was on average, expecting that with increasing land use intensity, we would find a more generalised community. We found, however, that the more human impact on a site, the more specialised the community was. Ecological theory suggests that an organism specialises in fewer habitats when these have stable conditions, and the more unstable the conditions, the more likely that only generalist species



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can survive. Nematodes are extremely diverse animals in terms of lifespan, living from days to months and even years (in the case of some plant parasites). Farmland management revolves around the idea of stabilising the environment for optimum plant growth by, for example, preventing droughts and floods or increasing nutrient availability. This management might in turn provide stable conditions for nematodes with shorter lifespans. So these nematodes might experience a farm as a stable environment, while longer lived organisms will also experience the seasonal disturbances associated with farming.