

SoildiverAgro project

Adoption of new management practices to increase crop production and quality



THE WHAT AND WHY

Assessing the biodiversity status of soil ecosystems is challenging

There is a considerable need for reliable, high-throughput monitoring methods to aid the formulation of recommendations and the development of strategies for restoration, sustainable use and protection of European agricultural soils. Nematodes are often applied as bioindicators to assess soil biodiversity and associated ecosystem services. However, their morphological characterisation is limited only for taxonomic experts and DNA-based tools, applicable also for non-nematode specialists, are currently under development.

1. A diverse nematode community from a soil sample under the microscope (ILVO).



HOW IS THE CHALLENGE ADDRESSED

DNA-metabarcoding of nematode communities is suitable for soil biodiversity assessments

The SoildiverAgro-project (H2020 project 817819) has investigated a couple of aspects for a more accurate characterization of nematode communities from soil samples by DNA-metabarcoding. This technique makes it possible to

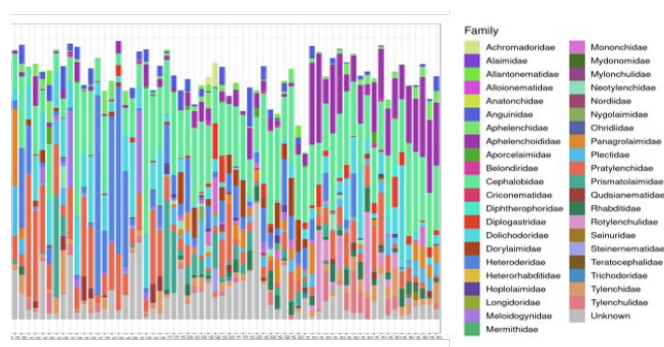


2. AZC, automated zonal centrifuge, is a specialized machine able to isolate approximately 95% of all nematodes from a soil sample (100mL) into a small beaker (40mL nematode suspension).

KEYWORDS

Biodiversity, bio-indicators, DNA, molecular characterization, nematodes, soil ecosystems.

characterize simultaneously hundreds of nematode communities each isolated from another soil sample. Firstly, an expanded and curated database of nematode sequences (18S rRNA) was obtained. This database is essential to be able to characterize each nematode present in any community. Secondly, different bio-informatics pipelines were compared to select the one most efficient and reliable for nematode identification. Thirdly, a DNA-extraction method able to extract DNA from preferably all nematode individuals present in a soil sample was developed. Although efforts are continued to further increase the quality of the established nematode DNA-metabarcoding protocol, it can be concluded that the technique is more than ever ready to replace the time-consuming morphological characterization of nematode communities for soil biodiversity assessments.



3. Composition (family level) of nematode communities from soil samples. Each bar represents another community (ILVO).

AUTHORSHIP

Lieven Waeyenberge, Flanders Research Institute for Agriculture, Fisheries and Food (ILVO) Merelbeke, Belgium.



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