

Identification and functional roles of amoeboid protozoa in soil

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Abstract

Protozoa are the major consumers of bacterial production in soil, forming the base of the heterotrophic eukaryotic food web that channels the energy flow via bacteria to higher trophic levels in soil (i.e. the bacterial energy channel). Among them, amoebae are of major importance due to their small size, high abundance, fast turnover and ability to penetrate even the smallest pores, making them key regulators of bacterial biomass and nutrient cycling.

Despite these important functions for soils we have only a vague idea on the identity of the dominant taxa of amoeboid organisms in soils.

Within my PhD project as part of the EU-project EcoFINDERS we aim to increase the knowledge about amoeba combining microscopic and molecular techniques, eventually to determine their diversity across soils throughout Europe using high-throughput sequencing.

Cultivation of amoeboid organisms and subsequent morphological and molecular description from several soils indicated an enormous hidden diversity and the existence of high numbers of new taxa and even genera. This information is crucial to develop effective genetic barcodes targeting broader protozoan taxa for pyrosequencing.

First ecological studies investigating grazing of amoebae have confirmed strong impacts on total bacterial biomass and community composition. Further we found grazing differences even between closely related taxa suggesting niche specialisation, making it difficult to treat protozoa as a single functional black box in soil food webs.