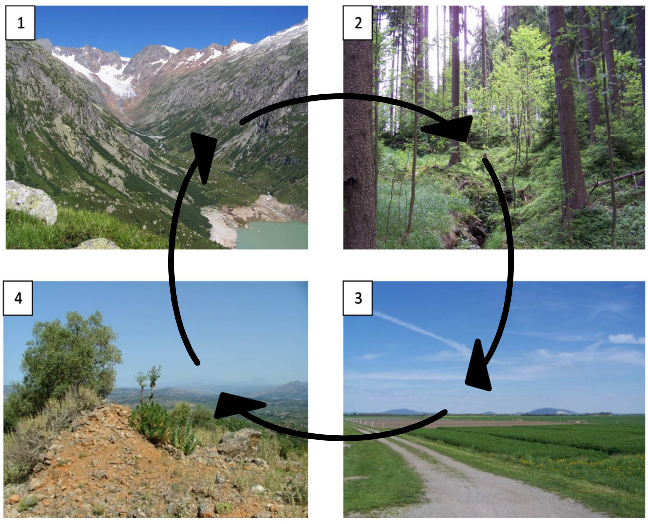
WAGENINGEN UNIVERSITY
WAGENINGEN UR

Food Webs and Ecosystem Services during Soil Transformations

Jeroen P. van Leeuwen[1] , Peter C. de Ruiter[1], Lia Hemerik[1], Jaap Bloem[2]
[1] Biometris, Wageningen University [2] Alterra, Centrum Bodem, Wageningen UR

Introduction

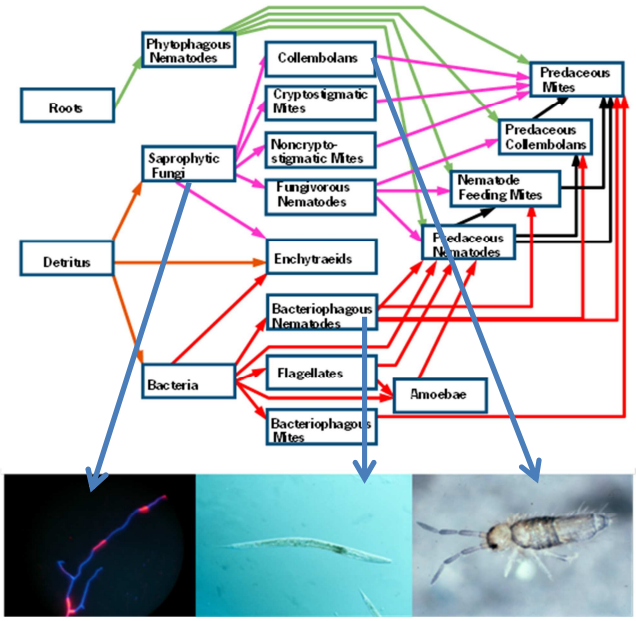
The use of land for agriculture, commercial forestry, and other goals forms the most substantial human alteration of the Earth system. This currently represents the primary driving force in the loss of biological diversity and habitat degradation worldwide. Much is still to be learned about how soils transform through these kinds of land uses. The EU project Soil Transformations in European Catchments (SoilTrEC) aims at developing an integrated model of soil processes and ecosystem services, by studying areas with newly formed to severely degraded soils. The functional role of the soil food web interactions (especially microbes) and the importance of these in ecosystem functioning form an essential part of this project.



Study sites along the soil formation cycle. The numbers refer to the site description below.

Study sites (Critical Zone Observatories)

1. Damma Glacier, Switzerland; initial site of soil development on bedrock
2. Lysina, Czech Republic; productive soil management for intensive forestry
3. Fuchsenbigl, Austria; productive soil as arable land
4. Crete, Greece; severely impacted by centuries of grazing and farming



Schematic food web with examples for some trophic groups.

Aims

- Gain a better understanding of soil processes during soil transformations

- Analyze food web stability, diversity and complexity along soil formation chronosequences in Switzerland and Austria
- Integrate soil food web model with chemical and physical soil models

Methods

At the four study sites soil parameters (physical, chemical and biological) are measure. Based on these empirical data the food web will be modelled following De Ruiter *et al.* (1993). Food web stability, diversity, complexity will be analysed along the soil formation-gradient. Food web structure will be linked to physical and chemical processes (e.g. aggregate formation and structure, C and N mineralization).

De Ruiter *et al.* (1993). Simulation of nitrogen mineralization in the below-ground food webs of two winter fields. Journal of Applied Ecology 30: 95–106.

Wageningen University
Biometris, PSG
P.O. Box 100, 6700 AC Wageningen
Tel 0317 481431
E-mail jeroen.vanleeuwen@wur.nl
Internet www.biometris.wur.nl