



Microbial Natural Attenuation of Micropollutants in the Water Cycle

Dec 2013 - 2015

Researcher
Nora Sutton

Collaborators
Dr. ir. Alette Langenhoff
Prof. dr. ir. Huub Rijnaarts

Collaborators
Prof. dr. Hauke Smidt
(microbiology)

Motivation

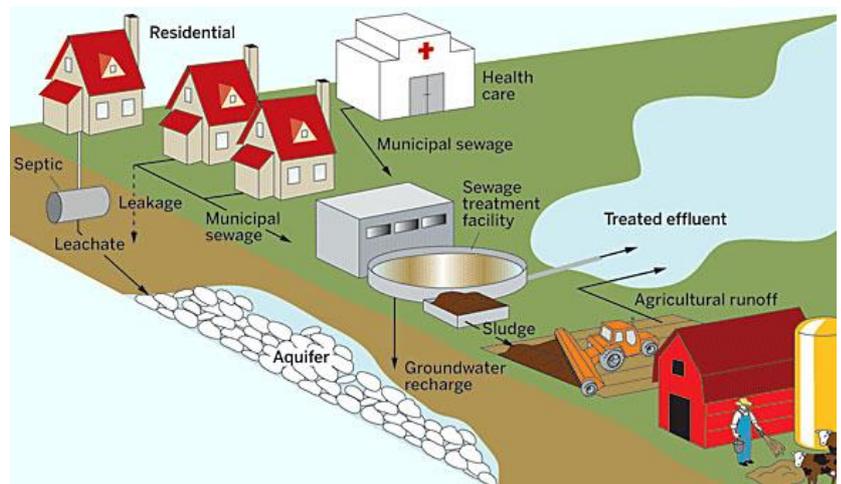
The increasing presence of organic micropollutants in different segments of the water cycle threatens future water resources. These micropollutants are currently being detected at low concentrations in groundwater and surface water used for drinking water intake. While current monitoring (chemical analyses) gives an indication of the presence of these micropollutants, little is known about the natural attenuation of micropollutants under in situ conditions. This information is required to assess and mitigate the risks of contamination of drinking water resources. The aim of this research is to develop tools to assess microbial biodegradation capacity and activity.

Method

The project will focus on a number of micropollutants that specifically threaten Dutch drinking water quality. Collaboration with drinking water companies will lead to a list of priority compounds for further research. For these compounds, biomolecular tools based on DNA analysis will be setup to assess the natural attenuation capacity in field samples. Additionally, ex situ degradation experiments using field samples as inoculum will be used to estimate degradation rates. Results will be integrated to form guidelines for the prediction of natural attenuation using molecular tools.

Technological challenge

This research project aims to improve the understanding of biodegradation of micropollutants by developing tools to determine biodegradation capacity of a number of key compounds. Micropollutants have very diverse chemical structures and are present at low concentrations. These factors make it is very difficult to determine degradation pathways and develop tools to assess natural attenuation. Also, there is a lack of information on biodegradation rates under environmental conditions. This information is required to improve models used to assess and predict the long term risks of contamination of drinking water intakes.



Sources, transport, and fate of micropollutants in the environment (EPA).



CV Researcher; Nora Sutton
 Graduated; Utrecht University (MSc Geochemistry 2008)
 WUR (PhD Environmental Technology 2014)
 Hobbies; rock climbing, cooking, yoga, backpacking
 e-mail; Nora.Sutton@wur.nl
 tel; 0317-483339
 website; www.ete.wur.nl