

‘Forever chemicals’: where do they all end-up?

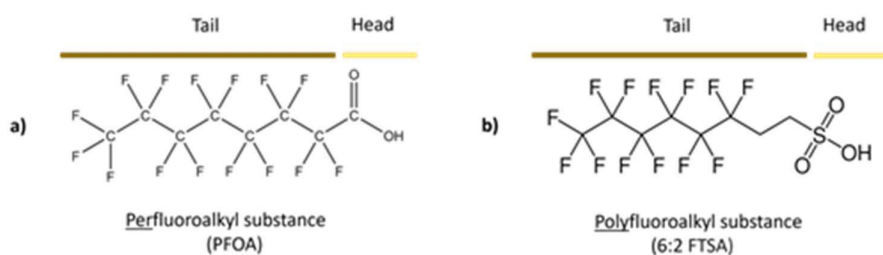
PFAS in Arabidopsis, spinach and lettuce. Does PFAS contamination result in hormesis?

Description

The presence of per- and polyfluoroalkyl substances (PFAS) in the environment is a critical and pervasive issue with far-reaching consequences for public health, ecosystems, and communities worldwide. PFAS is a class of over 7 million synthetic chemicals known for their water- and grease-resistant properties, and they have been widely used in industrial and consumer products, including stain- and water-resistant coatings, non-stick cookware, and firefighting foams. The extensive production, use, and discharge of PFAS in different industrial or consumer applications resulted in their ubiquitous presence in the environment and in biota.

Measurements around the 3M site have shown elevated PFAS concentrations in the soil. Residents in a 5 km zone around the 3M site show elevated PFAS levels in their blood when consuming locally grown vegetables, such as those from their gardens.

We want to investigate how leafy vegetables, such as spinach and lettuce, absorb various PFAS from contaminated soil. The plants will be grown in artificially contaminated soil with concentrations similar to those observed in the 5 km zone around the 3M site. We will examine where PFAS accumulates in the plants and whether the measured levels exceed consumption standards. A previous study indicates that a phenomenon called hormesis takes place. By adding PFAS in different concentrations over a gradient, we want to test this hypothesis. By comparing plant growth hormone levels, the growth response to PFAS contamination is further examined.



Methods

- Identification and quantification of PFAS using UPLC-MS/MS
- Identification and quantification of plant hormones using UPLC-MS/MS
- *In situ* mass spectrometry by DESI
- Plant growth analysis using digital image analysis

Research group: IMPRes

Supervisors:

Prof. Els Prinsen, Demi Rotthier

Email: els.prinsen@uantwerpen.be; demi.rotthier@uantwerpen.be

Tel: 03/2653711

Location: CGB U.513