



Bachelor/Masterthesis Project in Environmental Chemistry in Zürich, Switzerland

Column Chromatography to Assess Mobility of Natural Toxins in the Aquatic Environment

Natural toxins are not yet commonly regarded as environmental contaminants of concern for water quality. However, over 34% of plant secondary metabolites (phytotoxins) fulfil the criteria for aquatic persistency, mobility and toxicity based on predicted property data. Phytotoxins such as the carcinogenic Ptaquiloside from Bracken fern or the estrogenic Formononetin from red clover have been previously found in surface water bodies. The NaToxAq project (<http://natoxaq.eu>) now aims to obtain a deep insight on natural toxins as environmental contaminants to ensure the production of clean drinking water. The focus is put on origin, distribution and fate of natural toxins as emerging aquatic pollutants and potential remediation strategies.

Within this context, our ongoing research focusses on the experimental determination of natural toxin sorption coefficients to different geosorbents as crucial input parameter for reliable risk assessment. Using organic matter as a first sorbent, organic carbon-water partitioning coefficients (K_{oc}) were derived as primary toxin mobility indicator. Results show that column chromatography can be reliably applied in systematic sorption studies of large diverse sets of polar, mobile compounds. The goal of future studies is to apply the same method to other sorbents (e.g., minerals, activated carbon, biochar) to determine their individual contribution to the natural toxins' overall mobility on their path from source to tap (drinking water).

Your project and tasks:

- systematic sorption study of natural toxins to either clay minerals or carbonaceous materials (depending on start date, earliest February 2020)
- planning and execution of lab trials to assess the presented topic
- largely independent execution and evaluation of experiments
- discussion of results in the scientific context

Your profile:

- B.Sc./M.Sc. student in Analytical Chemistry, Environmental Science, Water Science or similar
- experienced in laboratory work
- fundamental understanding of environmental chemistry

What to expect:

During your project, you will be a member of the research group Environmental Analytics at Agroscope Reckenholz in Zürich, Switzerland and supervised by experienced researchers in the field. We cannot offer remuneration for your work but can assist you in any way possible in organizing your stay with us.

If we caught your interest, please feel free to contact Carina Schönsee with any questions!

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