PhD position, Predator ecology in soil

Applications are invited for a PhD fellowship/scholarship at Graduate School of Technical Sciences, Aarhus University, Denmark, within the Environmental Science programme. The position is available from 01 August or later.

Title:
Predator ecology in soil

Research area and project description:
The PhD student will be part of a large international and vibrant collaboration between Aarhus University, Denmark's Technical University, University of Copenhagen, North Carolina State University and several others. The collaboration project is part of the INTERACT (Decoding the Rhizobiota Interactome for Improved Crop Resilience) project financed by the Novo Nordisk Foundation. INTERACT (https://ccrp.vcl.ncsu.edu/content/interact) is one of three projects under the CCRP (Crop Collaborative Resiliency Program). The overall aim of INTERACT is to decode microbial interactions in the complex soil matrix, in relation to soil biogeochemical status, water stress as well as pathogen attackthat will improve plant performance. Thus, INTERACT will provide a science-based platform for new agricultural practices and biotechnological solutions enabling plant producers to manage their production ecosystems in a resource-efficient way with limited environmental footprint based on an in-depth understanding of key ecological functions in the wheat rhizosphere. The main focus is to decipher microbial communication among and between protists, bacteria and fungi in rhizosphere and soil environments. Much is unknown about the significance of soil microbes, especially through chemical communication and signalling, on rhizobiome development and function. INTERACT will provide insight into the rhizosphere ecology, as a basis for actively influencing the assembly of effective rhizosphere communities to support plant health and productivity, either through biotechnological or agronomic approaches.

The PhD student will study the protist predators including unicellular fungal and bacterial feeding organisms like flagellates, amoebae and ciliates and their effects on the microbiomes of wheat rhizosphere and soil. The objective is to 1) identify and characterize essential protists and describe their beneficial and detrimental effects to crop health 2) map microbial communication through secondary metabolites and predation on the microbiome 3) unravel the predation mechanism on cross kingdom community assembling process in rhizosphere. Hence, this will increase our understanding of interaction and ecology of protists and microbiomes in rhizosphere and soil. This will be studied both in very controlled laboratory conditions and in step-wise moving towards natural complex systems of soil and rhizosphere. Techniques to be used will encompass conventional methods of culturing, using microscopy and flow cytometry and molecular tools for metagenomics and transcriptomics. The ambition is to identify significance and activity of specific genes for protist activity, predation and exometabolite production and correlate to bacterial abundance, diversity and activity. The PhD position involves contributing to new knowledge on the communication by exudates among predators and prey and thereby impact of protist predators on rhizosphere and soil microbiomes.

Project description (½-4 pages). This document should describe your ideas and research plans for this specific project. If you wish to, you can indicate an URL where further information can be found.

Qualifications and specific competences:
Suitable applicants to the PhD position must have a Master's degree in Microbiology, Molecular biology, or Environmental or Agricultural Microbiology, an established understanding of microbial ecology, with a desire to work in an international environment and participate in cross disciplinary collaboration with national and foreign partners. An exchange research stay of 3 - 6 months in another research environment is a requirement.

Place of employment and place of work:
The place of employment is Aarhus University, and the place of work is Section of Environmental Microbiology, Frederiksborgvej 388, 4000 Roskilde, Denmark.

Contacts:
Applicants seeking further information are invited to contact:

- Professor Anne Winding, aw@envs.au.dk
- Reseacher Rumakanta Sapkota rs@envs.au.dk

How to apply:

Please follow this link to submit your application. Application deadline is 15 May 2022 23:59 CEST Preferred starting date is August 1, 2022.

For information about application requirements and mandatory attachments, please see our application guide.

Please note:

- The programme committee may request further information or invite the applicant to attend an interview.
- Shortlisting will be used, which means that the evaluation committee only will evaluate the most relevant applications.

Aarhus University's ambition is to be an attractive and inspiring workplace for all and to foster a culture in which each individual has opportunities to thrive, achieve and develop. We view equality and diversity as assets, and we welcome all applicants. All interested candidates are encouraged to apply, regardless of their personal background. Salary and terms of employment are in accordance with applicable collective agreement.