



Job advertisement Agroscope

Position

PhD Project: Survey of microbial communities in soils across Switzerland and testing their response to environmental and anthropogenic influences

Introduction

Soils are complex and diverse habitats for an enormous biodiversity and they provide various essential functions such as crop production, nutrient cycling or water filtration. Although soil organisms play integral roles in most soil functions, they are often overlooked in soil quality monitoring programs. In order to understand and protect soil microbial communities and their functions in agricultural systems, it is important to assess their resilience to management-related stresses such as compaction, plant protection and fertilization.

The aim of this PhD project is to assess the microbial diversity across Switzerland, the occurrence and distribution of taxa, their correlations to environmental factors and their reaction to various stresses. For the assessment of fungal diversity in Swiss soils, we will take advantage of the already established sampling across Switzerland, i.e., the biodiversity monitoring of Switzerland (BDM). Stress tests will be performed either at field sites, in the greenhouse or in climate chambers at the research station Agroscope. Microbial communities are assessed using molecular tools, such as metabarcoding of ribosomal marker genes. The workflow includes design of pot trials, collection of soils, DNA extraction, PCR amplification of the markers and to a large extent bioinformatics and statistical analyses. Bioinformatics, such as quality control of the sequences, and statistical analyses are performed using UNIX based pipelines and R-codes, which are continuously advanced. Through this research activities the PhD student will gain a comprehensive understanding of molecular microbiology, from field to lab work as well as data analyses, and including both, descriptive and experimental approaches.

Tasks

- Assessment of fungal communities in the Swiss biodiversity monitoring system (BDM) and the environmental factors, which explain their occurrence and composition
- Design and performance of field and pot trials to determine the detailed bacterial and fungal community responses to the application of different fertilizers composts using metabarcoding
- Bioinformatic and statistical analyses of metabarcoding data as well as adaptation and development of analytical pipelines and R-codes
- Presentation of research findings at national and international conferences
- Publication of the results in scientific journals

Requirements

- MSc in molecular biology, microbiology, ecology, or agronomy
- Experience with statistics (R) in ecology and LINUX
- Achievement-oriented, open-minded personality with spirit for teamwork
- Good communication skills in English and preferably also in German

Organisation

Agroscope is an innovative research institute for agriculture and nutrition, run according to the principles of New Public Management. Agroscope is part of the federal administration and is associated with the Federal Department of Economic Affairs, Education and Research EAER. It has research stations at a number of sites across Switzerland and the head office is in Bern (Liebefeld).

The research group Molecular Ecology focuses on genetic analyses of microorganism, insects and plants in agricultural contexts. Main interests are the development and application of genetic markers to study genetic diversity, the investigation of biological soil quality, as well as the exploration of ecological aspects in microbial pest control.

We offer an attractive project and work environment in a young and multidisciplinary research team as well as thorough initial training. Agroscope has excellent research facilities with well-equipped laboratories,



greenhouses, climate chambers and agricultural fields. You will enjoy flexible working hours and good employee benefits. You will be enrolled as a PhD student at ETH Zürich.

Place of Work	Agroscope, Zurich-Affoltern
Salary Category	According to the guidelines of the Swiss National Science Foundation
Employment Level	100%

Application

If this challenge appeals to you and you meet our requirements profile, we look forward to receiving your online application to human.resources@agroscope.admin.ch (REF. 42988)

Online applications consist of a single PDF containing an application letter, CV, copy of certificates/Diplomas (MSc & BSc) and Email addresses of 2 references. Deadline for application is August 20th, 2020.

For further information you may contact: Dr. Franco Widmer head of the research group Molecular Ecology, phone +41 58 468 73 76, franco.widmer@agroscope.admin.ch (Do not send applications to this e-mail).

Starting date: November 1st 2020 or upon agreement - Duration: 4 years.