

Open PhD student position

PhD student position in microbial ecology of freshwater karst communities will be open in 2020 at the Department of Aquatic Microbial Ecology, Institute of Hydrobiology, Biology Centre CAS České Budějovice, Czech Republic

The announced position is within the framework of a research project addressing local and general patterns in microbial communities of surface and subsurface aquatic karst habitats across Europe. Our team will mainly focus on ecological processes taking place in microbial communities of subsurface aquifers and on their role in assembly of microbial consortia of deep lakes.

Description: we are looking for a highly motivated PhD student with strong interest in karst environments and ecology. The offered position will consist of three equally important components:

- *Fieldwork (10-20%)* will take place in difficult alpine karst terrain and will include experimental setups and sampling of streams, pools on the surface and in cave environments. The main study site is the karst area Siebenhengste (Switzerland).
- *Lab work (40-50%)* will consist of enumeration of microbes with Flow Cytometry, microscopy and CARD-FISH analyses; isolation, cultivation and characterization of microbes; and molecular biology techniques (DNA isolation, preparation for subsequent genomic vs. metagenomic analyses, PCR and qPCR).
- *Computational work (40%)* will be conducted with amplicon, genomic and metagenomic datasets and will include statistical approaches, tests of ecological concepts and eco-genomics.

The student will have opportunity to select a preferable direction of own research within these described opportunities.

Requirements: Applicants for the position should have a M.Sc. degree in Biology (preferably in Limnology, Microbiology and/or Ecology). A driving license valid in Europe and caving experience, as well as knowledge of ecological concepts would be desirable. Prior experience in linux/unix/perl/python programming would be considered favorably but is not a prerequisite for selection. Candidates must be proficient in English.

Application and Contact: In case of interest, please submit a single PDF file composed of:

- brief motivation letter with a statement of your research interests
- detailed CV (including your grades and gained practical experience)
- copy of the diploma certificate
- name and contact information for at least one reference.

The position will remain open until a suitable candidate has been found. Applications will be evaluated starting from December 20, 2019. Target start is January - February 2020, although a later start is possible.

Please send your application and/or questions regarding position to the PI of the project Dr. Tatiana Shabarova shabrik@gmail.com and indicate 'PhD Application' in the subject line.

For more information on the PI consult:

<https://scholar.google.cz/citations?hl=cs&user=-uOhMrgAAAAJ>

Project Background: The mechanisms underlying species distribution in metacommunities represent a challenging topic in microbial ecology. Although the interactions between species-sorting, mass-effects and neutral processes in planktonic communities of surface waters are well understood, both the microbial communities in deeper lake strata (hypolimnion) and mechanisms influencing their assembly are largely unknown. Moreover, the

role of groundwaters in formation of freshwater communities remains enigmatic. We aim to uncover microbial community composition and assembly mechanisms during transfers from soil to soil water and along continua of subsurface vs surface streams to a deep lake using amplicon sequencing and metagenomics. Additionally, compositional and functional differences between bacterial assemblages from subsurface vs surface flows, along with accompanying environmental alterations will be investigated. We hypothesize that communities formed by surface and subsurface streams are distinct and subsurface streams provide successful 'seed' phylotypes for aphotic, deep lake strata.

The Department of Aquatic Microbial Ecology (Institute of Hydrobiology, Biology Centre of the Czech Academy of Science) is an internationally recognized high-class institution for studying freshwater microbes. There are four well-equipped microbiological laboratories: a lab for bacterial isolation and cultivation, two labs dedicated to molecular biology and a radioisotopes lab. Instrumentation: a fully automated fluorescence microscope with image analysis (Zeiss AxioImager) for high-throughput evaluation of CARD-FISH stained samples, three fluorescence microscopes equipped with image analysis systems, inverted microscopes, a micromanipulator and microinjector, a spectrofluorometer, hybridization chambers, incubators. A flow cytometry equipped with an autosampler for 96-well plates. Full equipment for sampling is available including sampling boats, water samplers, automated winch, YSI multiprobes, bbe fluoroprobe, etc. A MinION and MinIT (Oxford Nanopore) for generating ultra-long sequencing reads, three 128-core Unix servers (768 Gb RAM), two 64-core Unix servers (512 Gb RAM) and three 100/160 Tb NAS storage are available with all relevant software installed for analyses of (meta-)genomic data.

City: České Budějovice (Budweis) is an old medium-sized city ca. 150 km south of Prague with 90,000 inhabitants, a relaxed atmosphere, and a growing international student community at the Biology Centre and the University. Both the town and the surrounding countryside provide numerous opportunities for research, sport and leisure activities. Living costs are low by international standards.

Infrastructure and Benefits: Position includes standard health insurance and social security. PhD students have accesses to university dormitories accommodation nearby the work place. Various training opportunities are available to broaden your expertise and skills. Czech courses are available for foreign students to reach a basic level of proficiency in everyday situations. Contract includes five weeks of holiday yearly. Biology Centre provides assistance in visa application process for foreign students.