

## CYANOCOST – ES 1105 Action

Cyanobacterial blooms and toxins in water resources:  
Occurrence, impacts and management.

### Short Term Scientific Mission (STSM) Know-How Exchange Finland-Serbia

#### Objectives

The purpose of this STSM was to transfer some critical parts of the acquired knowledge and technological know-how from Åbo Akademi University/Jussi Meriluoto to University of Novi Sad/prof. Zorica Svircev's group. The applicant in turn generally benefited from the vast experience of prof. Svircev related to health effects of toxic cyanobacteria, management of cyanoproblems, cyanobacterial taxonomy and cyanobacterial culturing.

#### Methodology

This STSM consisted of work and knowledge sharing in the following areas:

1. Setting up analytical facilities (LC-MS/MS) for microcystins in Serbia and related training.
2. Field work: **collection of samples from Ludas lake** (photo) and subsequent application of hydrogen peroxide to test the sensitivity of the cyanobacteria towards hydrogen peroxide treatment.
3. Public awareness raising and dissemination related to noxious cyanobacteria.
4. Knowledge sharing on the role of cyanobacterial biomarkers in paleoenvironmental reconstruction and cyanobacterial crusts in the process of loessification.
5. Work on joint manuscripts. Planning of future research projects. Special meetings.



#### Results

1. PhD students Nada Tokodi and Damjana Drobac were taught by JM to analyse and report LC-MS/MS data acquired by Bruker HCT ultra ion trap mass spectrometer. Over 120 data sets were analysed by the students under the supervision of JM. The data consisted of Serbian cyanotoxin samples run at Åbo Akademi by JM and Tamara Vazic (prof. Svircev's PhD student) in June 2014. b) LC-MS analytical facilities were set up at the collaborator unit Anahem and analytical consulting concerning microcystin analyses were given by JM to the MS operators during the STSM. c) Validation of microcystin analyses in Serbia were discussed with Dr. Milka Vidovic, Faculty of Technology, University of Belgrade. d) Dean, prof. Neda Mimica Dukic, prof. Svircev and JM discussed the analytical instrumentation (LC-MS/MS etc) available in Novi Sad and its exploitation for research and teaching.
2. Finnish experience from Lake Köyliönjärvi was transferred to Novi Sad. A field trip to Ludas Lake was made together with prof. Svircev and her students, and close to 100 litres of samples were taken for *in vitro* studies concerning elimination of cyanobacteria by hydrogen peroxide. The studies were started but not finished during the visit. Microcystin analyses were done in Turku in Sept. 2015. PhD students Tamara Vazic and Tamara Dulic as well as prof. Svircev were partners in this work.
3. Public awareness and dissemination issues related to noxious cyanobacteria were addressed during a 25 min TV interview of JM on Channel 9 and during many discussions.
4. Contributions to the BLOCDUST theory.
5. Work on joint manuscripts with prof. Svircev and her students concerned Serbian lakes, review of fish histopathology, cyanobacteria/loess/astrobiology, cyanotoxin-related cancers in Serbia, Graph of Life.

#### Highlights

Successful knowledge sharing and exchange which contributed to the establishment of a cooperative agreement between University of Novi Sad and Åbo Akademi in November 2014.

#### Researcher

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#### Host Organization

Department of Biology and Ecology  
University of Novi Sad  
Serbia  
Prof. Zorica Svircev

One later fruit of the STSM,  
the cooperative agreement  
between UNS and ÅA:

