EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

CYANOCOST – ES 1105 Action

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

Short Term Scientific Mission (STSM)

"Cyanotoxins: Sample preparation and determination by LC-MS and HPLC-DAD"

Objectives

The general purposes of this STSM are:

1. Training in determination of cyanotoxins;
2. Sample collection and sample preparation;
3. Determination of cyanotoxins in samples from Bulgarian water bodies.

Methodology

LC-MS and HPLC-DAD methods for determination of cyanotoxins were used. Training on sample collection and specific conditions for extraction of different cyanotoxins was done.

Results

1. Nutrient mediums for Microcystis and Anabaena were prepared according to the manual "TOXIC Cyanobacteriaml onitoring and CyanotoxinsA nalysis" pages 90-91. Three systems for 5 days cultivation were installed (2x2 | for Microcyslis and 1x2 I for Anabaena).
2. Duplicates of 10 biomasses were prepared for analyses of microcystins and cylindrospermopsin according to the manual "TOXIC Cyanobacterial monitoring and Cyanotoxins Analysis" pages 69-7I. Additional amounts of the extracts were evaporated and prepared for transportation to Bulgaria.
3. Two types of cartridges in duplicates were approbated for low and high level of Microcystins concentrations.
4. Eight portions of 250 ml from the both cultivated monocultures of Microcystis and 9 portions of 100 ml of cultivated monoculture of Anabaena were filtered through Watman GF/C filters. Three filters of each series were storage frozen and three other filters of each series were freeze - dried. The filters from the freezer were frozen and refrozen 3 times. A part of filters were freeze-dried and prepared for transportation in Bulgaria. Two portions of 250 ml supernatant of both Microcystis mono culture w ere separated and used for solid-phase extraction.
5. The filters from the freezer were extracted only with ultra-sonic bath. The freeze-dried filters were extracted with ultra-sonic bath and with ultra-sonic probe. A part of extracts of the filters which are prepared by both techniques were evaporated for transportation to Bulgaria.
6. All prepared during the STSM samples for HPLC analyses 34 HPLC extracts of Bulgarian freshwater samples and 14 HPLC extracts of Bulgarian sea water samples were analyzed for microcystins by DAD and LC-MS detectors.
7. The prepared during the STSM samples for HPLC analyses of cylindrospermopsin w ere analyzed by DAD and LC-MS detectors.
8. Training on prevention and maintenance o f LC-MS detector w as performed.
9. Training on detector calibration and data analyses w as done.
10. Microscopic exercise for determination of cyanobacteria genera w as done.
11. Scientific literature and guides were provided to the grantee.
12. Collaboration as coauthors in scientific publications.

Highlights

Studied methods will be implemented in the research laboratory at the National Center of Public Health and Analyses, Sofia.

Researcher

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Host Organization

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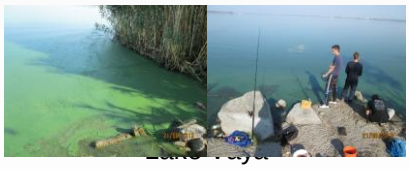
Sampling 2013



Lake Vaya

Drinking water reservoir Stoudena

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