

CYANOCOST – ES 1105 Action

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

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Researcher

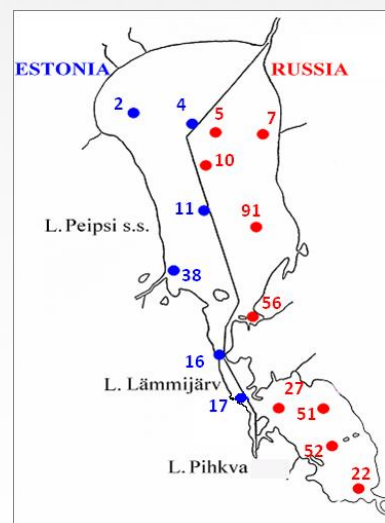
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Short Term Scientific Mission (STSM) Molecular detection methods for potentially toxic cyanobacteria in freshwater lakes

The aim of the STSM was to acquaint myself with new experimental and laboratory methods concerning molecular and analytical studies of toxic cyanobacteria. STSM was focused mainly on molecular detection and identification methods of potential microcystin and anatoxin-a producing cyanobacteria in environmental samples.

Objectives

- Detection, identification and quantification of potential microcystin producers in Estonian large and shallow lakes.
- Detection and identification of potential anatoxin producers in Estonian large and shallow lakes.
- Identification and quantification of cyanotoxins in environmental samples

Methodology

Sampling

- biweekly or monthly during vegetation period (May-Oct) in 2010 and 2012 respectively
- Joint expeditions in August 2010, 2011 and 2012
- Littoral zone in August 2010 and 2011

Detection, identification and quantification

- Conventional and quantitative PCR (TaqMan) with general and genus-specific microcystin synthetase E (*mcyE*) primers for detection and quantification of potential microcystin producers
- Conventional PCR with general *anaC* primers to detect potential anatoxin producers
- RFLP of *anaC* amplicons, cloning and sequencing of anaxgen amplicons to identify potential anatoxin producers in the lake
- LC-MS (Liquid chromatography–mass spectrometry) for toxin analysis

Results

- ~200 samples were analyzed using general and genus specific *mcyE* primers (Fig.1)
- MC were found in all analyzed samples but in a relatively small concentrations
- The *anaC* gene was detected in 35% of environmental samples

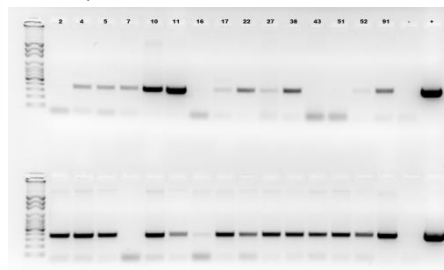


Figure 2. Detected *anaC* gene in Aug. 2010 and 2011
* see sampling points from the map

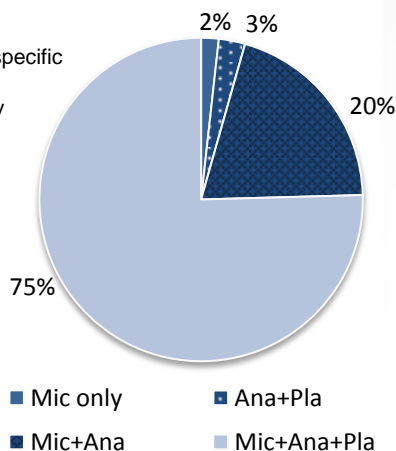


Figure 1. Potential MC producers in Lake Peipsi

References

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- Photo: Reet Laugaste



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