

TOXIN PRODUCTION RESPONSES TO SHORT- VS. LONG-TERM WARMING IN CYANOBACTERIA

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Duration (Starting date 28/09/2025 - Ending date 04/10/2025)

Aim of the STSM

- Cyanobacterial blooms pose a growing threat to water quality and public health due to their production of potent toxins, which may be intensified by rising temperatures. This project investigated how both short-term heat exposure and long-term warming affect toxin production in *Microcystis* sp. and *Planktothrix* sp., aiming to clarify temperature-driven changes in cyanobacterial toxicity.

Methodology

- Five toxin-producing strains - two *Microcystis* sp. and three *Planktothrix* sp., originally isolated from Romanian freshwater lakes - were grown at 22°C and 26°C for 1, 2, 4, 8 weeks and over 6 years. Biomass samples were collected and transported to RGU Aberdeen, where UHPLC-QTOF analyses were performed to quantify total microcystins and examine temperature-driven changes in toxin variants and secondary metabolite profiles.

Main Outcomes & Follow-up

- Preliminary results indicate that both temperature and exposure duration clearly affect toxin production, particularly in *Microcystis aeruginosa*. Distinct differences in microcystin profiles were observed between short-term and long-term warming treatments, suggesting that the duration of heat exposure may play a key role in shaping bloom toxicity. Ongoing analyses of UHPLC-QTOF data will provide detailed insight into changes in individual toxin variants and other metabolites influenced by temperature.
- The outcomes will lead to a joint scientific publication and already serve as the foundation for a collaborative proposal for the upcoming Water4All 2025 call, developed together with RGU and new international partners.

Acknowledgments

This poster is based on work from a Short-Term Scientific Mission (STSM) granted by COST Action CYANOACTION (CA23160), supported by COST.

Funded by the European Union