

CYANOCOST Working Group 1

Occurrence of cyanobacteria and cyanotoxins
(including methods for monitoring and analysis)

Overview with emphasis on the
latest developments 2015-2016

Aims of WG1 (from MoU)

1. The **spreading of knowledge and sharing of expertise** in the identification, detection and analysis of **cyanobacteria and cyanotoxins**.
2. To **gather all available data and experience and disseminate results** relating to the presence of **cyanobacterial mass populations and cyanotoxins** in natural and controlled waters across Europe.

Specific topics, WG1

- **Training** in development and validation of advanced analytical techniques for the **detection and quantitative determination of cyanotoxins** with emphasis on new-emerging cyanotoxins and especially targeting fast, specific, accurate and multi-toxin methods. Research will involve various analytical techniques (LC-MS, High Performance Liquid Chromatography HPLC, Enzyme-Linked Immunosorbent Assays-ELISA, toxicity assays, sensors etc).
- **Training** in development and validation of **molecular techniques** (quantitative Polymerase Chain Reaction-qPCR, sandwich-hybridization assays, DNA chip assay) for the detection, counting and identification of cyanobacteria.
- Activities towards the **standardization and harmonization of the methods** used for the detection, counting and identification of cyanobacteria and cyanotoxins. **Exchange** of samples, evaluation of methods, validation requirements and criteria.
- Spreading awareness and experience in high resolution **remote sensing** for cyanobacterial blooms monitoring.
- Presence of toxic cyanobacteria, with emphasis on **new - invasive cyanobacterial species**, such as *Cylindrospermopsis raciborskii* and others. Study of their occurrence, genetic characterization, diversity, ecology and associated risks. The role of climate change on the prevalence of the cyanobacterial species will be further addressed.
- **Emerging cyanotoxins** in the European region. Research efforts will be focused on the prevalence of emerging cyanotoxins such as cylindrospermopsin or the extremely strong neurotoxins, PSTs (saxitoxin and analogues) as well as new toxins such as BMAA.
- **Ecology and diversity** of cyanobacteria and toxins, also in estuarine and transitional waters.

Achievements -- Deliverables

- A **handbook of methods for the detection-determination of cyanobacteria and cyanotoxins** as “Standard Operating Procedures”, complemented with validation data. The Handbook will be based and further expand and improve the one resulted from the FP5 TOXIC project. The Handbook is expected to set a starting point for the standardization of methods at a national, European (CEN) or international (ISO) level. **COMING OUT IN DECEMBER 2016, ADDITIONALLY ANOTHER HANDBOOK ON MOLECULAR TOOLS**
- A practical **handbook for the validation requirements** of methods, to support European laboratories that want to be accredited according to EN ISO 17025. **INCLUDED IN THE FIRST HANDBOOK**
- Identification of the **best-performing and cost-effective methods**. **CF HANDBOOKS**
- **Transfer of technical knowledge** by training visits among partners. **>20 STMSs**
- **Articles** and reviews in peer-reviewed scientific journals. **TENS OF PAPERS**
- **Contributions** to the **book** that will be created within the COST Action. **SEVERAL**
- **Contributions** to the **conferences** organized by the Management Committee (MC) with a focus to the transmission of knowledge to the young generation of scientists (by special sessions, for example). **SEVERAL TRAINING SCHOOLS AND OTHER EVENTS**
- Substantial **feed of information** and results to all other WGs. **TRUE**

WG1 activities 2012-2014

- Establishment of new collaborations and networks
- Work on two Handbooks with quality, practical usability and inclusiveness as drivers
- Steady flow of STSMs
- Steady flow of published papers
- Exchange of samples and research materials
- Joint use of advanced instrumentation and facilities
- Sessions at Management Committee meetings
- Planning of the training schools to be realised in 2015-2016

as reported at earlier MC meetings etc

Recent WG1 activities 2015-2016

- The BMAA analysis Workshop/Training School, May 2015, Wageningen, the Netherlands, organized by Els Faassen and Miquel Lüring. Results published in Marine Drugs 2016
- The Brno Training School at RECETOX, June 2015, organized by Ludek Blaha
- The CYANOCOST/NETLAKE Training School: From A to Z: Methods for a successful multi-lake survey of cyanobacteria, Evian, May 2015, organized by Bas Ibelings
- The “Advanced Course on Cyanobacteria and Cyanotoxins” Training School, Madrid, June-July 2015, organized by Antonio Quesada
- CYANOCOST Session in “Fifth Joint Symposium and AOAC Task Force Meeting Marine & Freshwater Toxins Analysis”, Baiona, Spain, June 2015, organized by Ana Gago-Martinez
- Mutagenisation workshop on the toxigenic cyanobacterium *Planktothrix*, Mondsee, Austria, June 2016, organized by Rayner Kurmayer and Guntram Christiansen

Recent activities (cont.)

- Finalisation of the Handbook of Cyanobacterial Monitoring and Cyanotoxin Analysis, edited by Jussi Meriluoto, Lisa Spoof & Geoffrey A. Codd
- Finalisation of the Molecular Tools... Handbook, edited by Rainer Kurmayer, Kaarina Sivonen, Annick Wilmotte & Nico Salmaso
- Several STSMs
- Multitude of articles including those intended to the Special Issue of Advances of Oceanography and Limnology (=Final Action Dissemination)
- Exchange of samples, ideas, know-how...

THANKS

- My sincere and humble thanks to everyone involved in Working Group 1 for making it and CYANOCOST a success story!!!