

CYANOnews

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CYANOnews
is the Newsletter of CYANOCOST
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It is published bimonthly and it contains news on cyanobacteria & cyanotoxins and from the CYANOCOST network such as:

- Activities and outcomes
- Conferences, workshops
- Jobs, scholarships
- Publications
- News
- Research projects

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The cyanobacterial neurotoxin L-BMAA in non-phototrophic microbes: environmental implications.

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The neurotoxin, β -N-methylamino-L-alanine (BMAA) has been detected in diverse natural populations of aquatic and terrestrial cyanobacteria, and (critically-) the ability of cyanobacteria to biosynthesise this non-encoded amino acid has been confirmed using axenic monocyanobacterial cultures (Downing et al., 2011; Nunn and Codd, 2017). Wider sources of BMAA in aquatic environments have been indicated by its production by axenic strains of Baltic Sea diatoms (Jiang et al., 2014) and in dinoflagellates (Jiang and Ilag, 2014). It should be noted, however that the persistent association of bacteria with dinoflagellate cells leaves open the attribution of BMAA biosynthesis in these consortia. In the 50 year-old history of BMAA research (Nunn, 2017), early findings of BMAA in chemoheterotrophic bacteria appear to have been overlooked. The amino acid was identified during searches for novel peptide antibiotics in the bacterium *Paenibacillus pulvifaciens* (formerly *Bacillus pulvifaciens*). More recently, BMAA was found to be associated with similar peptides in *Paenibacillus larvae*, a pathogen in the devastating American Foulbrood disease of honeybees (Müller et al., 2015; Nunn and Codd, 2019). These findings establish the principle that BMAA biosynthesis can occur in non-phototrophic (chemoheterotrophic) bacteria. Although *Paenibacillus* spp. occur widely in terrestrial and aquatic environments, the extent of BMAA biosynthesis by these and other non-phototrophic bacteria is unknown but clearly requires investigation.

References

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Solutions for managing cyanobacterial blooms: A scientific summary for policy makers. IOC/UNESCO 2019.

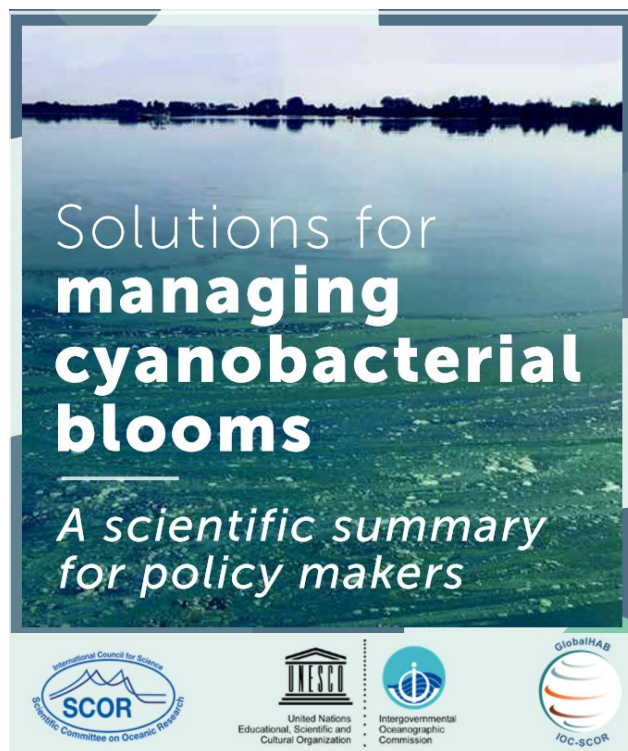
This report was prepared by the SCOR-IOC Scientific Steering Committee of the Global Ecology and Oceanography of Harmful Algal Blooms research programme GlobalHAB, with contributions from colleagues.

GlobalHAB (since 2014) is an international programme that aims to improve understanding and prediction of HABs in aquatic ecosystems, and management and mitigation of their impacts, and is sponsored by the Scientific Committee on Oceanic Research (SCOR) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO.

Authors: M.A. Burford (Griffith University), C.J. Gobler (Stony Brook University), D.P. Hamilton (Griffith University), P.M. Visser (University of Amsterdam), M. Lurling (Wageningen University), G.A. Codd (University of Dundee).

This guide can be accessed via:

http://www.globalhab.info/files/Cyano_mitigation_GlobalHAB2019.pdf



Global Intensification of Cyanobacterial Blooms: The Driving Forces and Mitigation Approaches— Frontiers research topic

This Frontiers Research Topic presents research papers and reviews that explore novel approaches expanding our understanding of the development of toxic phytoplankton blooms and their immense performance in a changing environment, with particular focus on *Microcystis* sp. It aims to address various aspects of cyanobacterial blooms including the following:

- abiotic and biotic drivers of cyanobacteria blooms,
- biological role of secondary metabolites, including cyanotoxins, in the bloom's lifecycle,
- allelopathic and info-chemical interactions between microorganisms involved in toxic blooms,
- competition in host/parasite interactions, including cyanophages,
- novel strategies for mitigation of cyanobacterial blooms.

Topic Editors:

Aaron Kaplan, Hebrew University of Jerusalem, Israel

Rainer Kurmayer, University of Innsbruck, Austria

Assaf Sukenik, Kinneret Limnological Laboratory, Israel Oceanographic and Limnological Research, Leon H. Charney School of Marine Sciences, University of Haifa, Migdal, Israel



Abstract submissions (deadline 01 April 2020) via:

<https://www.frontiersin.org/research-topics/12381/global-intensification-of-cyanobacterial-blooms-the-driving-forces-and-mitigation-approaches#overview>

CYANOjobs

- Postdoc position in Analytical Chemistry / Molecular Biology / Microbiology**, University of Gothenburg, Sweden
- Master Student Internship in Optimization of bioprocess for green algae growth**, Luxembourg Institute of Science and Technology
- PhD student position in Biotechnology and Applied Microbiology**, Chalmers University of Technology, Sweden.
- Postdoctoral position in NanoToxicology/Cell Biology**, Inserm/IMRB, France.
- PhD Position (bioanalytics) at the University of Vienna**, Austria.
- Post-doc position in Autophagy/Cellular Biology**, Inserm, France.

CYANOevents

- NaToxAq: Natural Toxins: Environmental Fate and Safe Water Supply** - 10th-12th June 2020, Brno, Czech Republic.
- SETAC Europe 30th Annual Meeting**, 3-7 May 2020, Dublin, Ireland.
- 19th International Conference on Harmful Algae (ICHA 2020)**, October 11-16, La Paz, Mexico.
- ProSynFest 2020**, 18-21 March 2020, Cordoba, Spain.



**CYANOCOST wishes you
a happy, productive and
wonderful New Year
2020 !**



Calls for Special Issues:

Special Issue "Selected Papers from the 11th International Conference on Toxic Cyanobacteria" – Toxins (Dariusz Dziga)

Special Issue "Harmful Cyanobacteria and Their Metabolites" – Applied Sciences (Jussi Meriluoto, Nada Tokodi)

"Recent Developments in LC-MS of Algal Toxins: Present and Future Challenges" - Toxins (Carmela Dell'Aversano, Luciana Tartaglione).

"Biological Role of Cyanotoxins: Experimental and In-Field Evidence" -Toxins (Spyros Gkelis, Piotr Rzymiski)

Impact of Mycotoxins, Cyanotoxins and Phycotoxins in Food Sustainability—Frontiers Research Topic (Luis Botana, Panagiota Katikou, Maria Sainz, Alison Robertson).

Global Intensification of Cyanobacterial Blooms: The Driving Forces and Mitigation Approaches—Frontiers research topic (Aaron Kaplan, Rainer Kurmayer, Assaf Sukenik).



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CYANOresearch

NaToxAq: Natural Toxins and Drinking Water Quality- From Source to Tap

NaToxAq is a European Training Network (ETN) funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 722493.

The ambition of the NaToxAq ETN network is to expand the research basis for EU's leading role in securing high quality drinking waters for its citizens. Focus is on natural toxins – a large group of emerging contaminants with unknown impact on drinking water resources. Both known toxins, like cyanotoxins, cyanogenic glucosides and terpenes and not yet explored toxins are investigated. NaToxAq trains **16 PhD fellows** (Early Stage Researchers), and provides a unique opportunity for young researchers to obtain the knowledge and skills needed to pioneer the field by investigating natural toxin emission via water reservoirs to water works and consumers. **The NaToxAq network** brings together 22 major research groups from leading universities, research institutes and water enterprises, constituting a highly innovative and multidisciplinary consortium from 7 European countries and USA.

NaToxAq is organizing the **“Natural Toxins: Environmental Fate and Safe Water Supply” Conference** on 10th-12th June 2020 in Brno, Czech Republic. A **call for abstracts** is now open, with deadline on 30 January 2020. The conference includes **keynote lectures** by Dr. Ingrid Chorus, Prof. Allan T. Stone and Prof. John Fawell.



CYANOpapers

Andrea Zsuzsanna Ujvárosi, Klara Hercog, Milán Riba, Sándor Gonda, Metka Filipič, Gábor Vasas, Bojana Žegura (2020). The cyanobacterial oligopeptides microginins induce DNA damage in the human hepatocellular carcinoma (HepG2) cell line. *Chemosphere* 240, 124880, <https://doi.org/10.1016/j.chemosphere.2019.124880>.

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Korina Manolidi, Theodoros M. Triantis, Triantafyllos Kaloudis, Anastasia Hiskia (2019). Neurotoxin BMAA and its isomeric amino acids in cyanobacteria and cyanobacteria-based food supplements. *Journal of Hazardous Materials* 365, 346-365. <https://doi.org/10.1016/j.jhazmat.2018.10.084> **This paper acknowledges CYANOCOST**

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M.A. Burford, C.J. Gobler, D.P. Hamilton, P.M. Visser, M. Lurling, G.A. Codd (2019). Solutions for managing cyanobacterial blooms: A scientific summary for policy makers. IOC/UNESCO, Paris (**IOC/INF-1382**).