



Abstract

Cyanotoxins Dynamics on Portuguese Freshwater Ecosystems on Current Global Changes [†]

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Abstract: Cyanotoxins are chemical pollutants produced and released by Cyanobacteria, the oldest living prokaryotes, and have well-established implications for human and aquatic biota health. Due to current global conditions, it has become essential to offer an overview of the dynamics of cyanotoxins occurrence in order to improve the prediction and control of our water resources. In Portugal, in recent years, the impacts on global warming have contributed to hot abnormal events and a rise in temperature. Between May and October in two consecutive years (2017–2018), seven freshwater ecosystems located in the north and central regions of Portugal were assessed for the occurrence of microcystins (mcyA), cylindrospermopsins (cyrC), anatoxin-a (anaC), and saxitoxins (sxtI) by applying genetics methods. Our findings illustrate that, in a year with two heat waves (2017), the occurrence of blooms increased, as did the number on cyanotoxins detected compared with the less warm year (2018). Despite this trend, two ecosystems escaped and maintained an elevated risk with regard to cyanotoxin detection. DNA sequencing revealed the presence of potentially toxic cyanobacteria in all sampled ecosystems. The data retrieved highlighted genotypes for all main cyanotoxins. Continuous monitoring efforts are demanded in Portugal for improving knowledge of the occurrence of cyanotoxins and for future national regulations. Preliminary data also revealed that the impact of global change on Portugal has improved cyanotoxin detection.

Keywords: microcystins; cylindrospermopsins; anatoxin-a; saxitoxins; PCR; risk assessment



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