biology and life sciences forum

MDPI

Abstract

Cyanobacteria and Cyanotoxins in Azorean Lakes: Spatial and Temporal Analysis of Long-Term Monitoring Data (2003–2018) †

Vítor Gonçalves [1,2,*,‡], Rita Cordeiro [1], Rúben Luz [1,2] and Amélia Fonseca [1,2]

[1] CIBIO, Centro de Investigacão em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado, Pólo dos Açores, Universidade dos Açores, 9501-801 Ponta Delgada, Portugal; rita.ip.cordeiro@uac.pt (R.C.); ruben.fs.luz@uac.pt (R.L.); maria.ao.fonseca@uac.pt (A.F.)
[2] Faculdade de Ciências e Tecnologia, Universidade dos Açores, 9500-321 Ponta Delgada, Portugal
* Correspondence: vitor.mc.goncalves@uac.pt
† Presented at the 7th Iberian Congress on Cyanotoxins/3rd Iberoamerican Congress on Cyanotoxins, Ponta Delgada, Portugal, 18–20 July 2022.
‡ Presenting author (oral communication).

Abstract: Eutrophication became the main environmental problem of Azorean lakes at the end of the 20th century, resulting mainly from the intensification of anthropogenic activities in the catchments. This problem raised great public concern, leading to the implementation of monitoring programs to assess the status of the Azores inland waters. During the monitoring programs, many cyanobacterial species were present in high abundance, and several blooms and cyanotoxins have been recorded over the years. In this work, monitoring data from twenty-three lakes, from 2003 to 2018, were analyzed to understand the distribution and dynamics of the presence of cyanobacteria and cyanotoxins, as well as the importance of local and global environmental factors. Although we found some interannual variability, the results confirm a high abundance of cyanobacteria in many lakes, frequently of toxic species. Besides a high correlation between the lake trophic state and the abundance of cyanobacteria, some changes in the communities, namely regarding the dominant species, suggest the influence of global factors as drivers of these changes. This study contributes to improving cyanotoxin monitoring programs and mitigation actions to control harmful cyanobacterial blooms (HCBs).

Keywords: cyanotoxins; eutrophication; anthropogenic effects; long-term data; HCBs

Citation: Gonçalves, V.; Cordeiro, R.; Luz, R.; Fonseca, A. Cyanobacteria and Cyanotoxins in Azorean Lakes: Spatial and Temporal Analysis of Long-Term Monitoring Data (2003–2018). *Biol. Life Sci. Forum* **2022**, *14*, 5. https://doi.org/10.3390/blsf2022014005

Academic Editor: Pedro Miguel Raposeiro

Published: 15 July 2022

Author Contributions: Conceptualization, V.G.; formal analysis and investigation, V.G., R.C. and R.L.; resources, V.G. and A.F.; writing—original draft preparation, V.G. and R.C.; project administration, V.G.; funding acquisition, V.G. All authors have read and agreed to the published version of the manuscript.

Funding: This work was funded by Portuguese National Funds, through FCT—Fundação para a Ciência e a Tecnologia, the European Union, QREN, FEDER, COMPETE, by funding the CIBIO/InBIO (project UID/BIA/50027/2013 and POCI-01-0145-FEDER-006821). Rúben Luz was supported by a Ph.D. grant (M3.1.a/F/002/2020) from the Fundo Regional da Ciência e Tecnologia (FRCT).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.