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Abstract

Expansion of Cylindrospermopsin in the Azores: Evidence for New Producing Taxa †

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Abstract: The worldwide expansion of cylindrospermopsin (CYN) has been a public concern due to its potential impacts on the environment, the economy, and mainly on human health. Due to global warming, this toxin has been reported in a wider range of countries, from tropical to temperate regions. The first report of cylindrospermopsin in the Azores came from an environmental sample collected in 2016 and was later found in two nostocalean cultured strains isolated from a eutrophic lake. This work gathers all the CYN data in the Azores and reports new identifications of toxic strains. Selected cultured strains (five) from BACA (Azorean Bank of Algae and Cyanobacteria) were analyzed for the presence of genes cyrA, cyrB, cyrC, and cyrJ by PCR and for toxin identification by ESI-LC-MS/MS. 16S rRNA phylogenetic analysis was assessed for all strains. The main results showed amplification of cyr genes in *Nostoc* sp. BACA0429, *Kamptonema* sp. BACA0455, and nostocalean strain BACA0109. However, ESI-LC-MS/MS did not identify CYN in any of the tested strains. The phylogeny also revealed that BACA0109 is close to previously identified CYN producers BACA0025 and BACA0031, described as potential new cyanobacteria taxa. The presence of CYN and CYN-producing cyanobacteria in the remote Azorean Islands is further evidence of the CYN global dispersion and an alert to the need for cyanotoxins monitoring and mitigation in the Azores' inland waters.

Keywords: PCR; 16S rRNA; cyr; ESI-LC-MS/MS; monitoring

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