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Abstract

Cyanobacterial Toxins—An Update of Toxins from Blue Biotechnology and Ecotoxicology Culture Collection (LEGE-CC) †

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Abstract: Cyanobacteria are microorganisms that have remarkable adaptability and can inhabit various types of aquatic and terrestrial ecosystems worldwide, including extreme environments. This group of organisms is considered a rich source of secondary metabolites with potential biotechnological applications and has the capability to produce some potent cyanotoxins that can induce consequences to human health. The Blue Biotechnology and Ecotoxicology Culture Collection (LEGE-CC) is a biological resource center located at the Interdisciplinary Centre of Marine and Environmental Research (CIIMAR), comprising more than 1200 different cyanobacterial and microalgae strains. Until now, 36 strains have been reported as producers of cyanotoxins distributed within different cyanobacterial orders. Recently, LEGE-CC has increased in numbers due to the isolation effort that has been made. In this work, a screening of more than 200 cyanobacterial isolates from subaerial and freshwater environments targeted the genes involved in the biosynthesis of cyanotoxins. As expected, genes involved in cylindrospermopsin, saxitoxin, anatoxin and microcystin production were detected by molecular biology tools. The strains where the genes were detected were grown and sent to liquid chromatography–mass spectrometry (LC-MS) to confirm the production of cyanotoxins. As a culture collection, the screening of cyanotoxins is an essential aspect of cyanobacterial research and provides a comprehensive idea of the production of these toxins for future works.

Keywords: cyanotoxins; cyanobacteria; culture collection; LEGE-CC

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