



VALORIZING NUISANCE CYANOBACTERIAL BIOMASS: INSIGHTS FROM A EUTROPHIC TROPICAL RESERVOIR IN BRAZIL

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RESUMO: Anthropogenic actions and climate change have increased the incidence and severity of cyanobacterial harmful algal blooms (cHABs) in water reservoirs worldwide. These blooms represent a problem for the ecosystem and a risk to human and animal health. Therefore, it is urgent to find new and better ways to manage cHABs. One possibility is exploring the biotechnological potential of this biomass. The wide range of secondary metabolites produced by cyanobacteria makes these organisms a promising source of bioactive compounds. This work combines mass spectrometry-based metabolomics and bioactivity assays to investigate a cyanobacterial biomass collected in a Brazilian eutrophic reservoir, looking for possible biotechnological applications. Metabolomic analysis revealed a significant presence of various mycosporine-like amino acids (MAAs), compounds with photoprotective and antioxidant potential, that are already used as natural bioactive ingredients in certain dermocosmetics. The extract produced from the cyanobacterial biomass displayed antioxidant activity. It was also able to protect the human keratinocyte line HaCaT exposed to ultraviolet radiation (UVR), significantly increasing its viability in comparison to untreated cells ($p \leq 0.05$). Also, the addition of the extract to a base system formulation enhances both UVB and UVA protection. About the toxicity,



the tested extract exhibited no acute toxicity at the tested concentrations (0.01-1000 μ g.mL⁻¹) against the microcrustacean *Artemia salina* and HaCaT cells. These results underscore the potential of environmental management strategies focused on the harvesting and utilization of cyanobacterial biomass for biotechnological

Palavras-chave: *mycosporine-like amino acids (MAAs), metabolomics, photoprotection, wastewater management, nuisance valorization*