

Potentially Toxic Cyanobacteria and Quantification of Microcystins/Nodularins and Cylindrospermopsin in Four Dams of Guanajuato, Mexico

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Abstract : The quality and availability of the water contained in dams (artificial bodies of water) are at risk due to the presence of uncontrolled growths of cyanobacteria capable of producing cyanotoxins that affect the ecosystem and harm the health of humans and animals. The physicochemical properties were measured, and the degree of eutrophy of four dams from Guanajuato was determined. They presented a pH of 6.1 to 8.4, conductivity of 121 to 415 $\mu\text{S}/\text{cm}^2$, chlorophyll of 0.43-42.43 $\mu\text{g}/\text{L}$, NO_3^- 0-1.2 mg/L and PO_4^{3-} 0.11 to 0.84 mg/L; considering these parameters, the prey most prone to the development of cyanobacterial blooms were El Palote dam, La Purísima dam, and Allende dam, but not El Conejo dam. The potentially toxic cyanobacteria identified were *Planktothrix agardhii*, *Oscillatoria* sp., *Raphidiopsis* sp., and *Microcystis* sp., Microcystin-LR, Nodularin, and Cylindrospermopsin were quantified, presenting values between 0.08-0.42 and 0.02-2.05 ppb, respectively, the water bodies with the highest concentration were El Palote dam and La Purísima dam. Microcystin-LR and/or Nodularin levels are within the guideline values for human consumption in drinking water established by the World Health Organization for Microcystin-LR and for Cylindrospermopsin by the Oregon Health Authority (OHA) in all dams. This work is relevant due to the use of these bodies of water for agriculture and human consumption in the state, and the presence of toxin-producing cyanobacteria can represent an environmental, ecotoxicological, and health problem, so it is recommended to establish a program of frequent monitoring of cyanobacteria and cyanotoxins in the state's dams.

Keywords : *Planktothrix agardhii*, *Raphidiopsis* sp., *Microcystis* sp., Cyanobacterial blooms, Cyanotoxins

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