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Abstract book

"Shaping aquatic science for the future we envision"

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Cyanobacterial toxins in the largest Italian lake: what we have learned in fifteen years of scientific monitoring in lake garda

Leonardo Cerasino^{1*}, Nico Salmaso^{1,2}

¹Fondazione Edmund Mach, via E. Mach 1 - 38060 - San Michele all'Adige (N/A (Outside USA/Canada)), Italia

²National Biodiversity Future Center, Piazza Marina, 61 - 90133 - Palermo (N/A (Outside USA/Canada)), Italia

Corresponding author: leonardo.cerasino@fmach.it

The presence of cyanobacterial proliferation in lakes and reservoirs has important negative consequences for the use of aquatic resources. In fact, various cyanobacterial species can produce toxic metabolites that can be harmful to humans and animals. Studies on the distribution of cyanotoxins in Lake Garda have been conducted since 2009 by using LC-MS/MS techniques. These studies shown that, among the toxigenic cyanobacteria present in the lake, *Dolichospermum lemmermannii*, responsible of sporadic superficial accumulations, does not produce toxins; *Tychonema bourrellyi* and *Planktothrix rubescens*, which proliferate in the euphotic zone, produce anatoxins (neurotoxic) and microcystins (hepatotoxic), respectively. As a matter of fact, microcystins and/or anatoxins have been found almost in all samples collected in the pelagic zone. Importantly, other toxins like cylindrospermopsins (cytotoxic) and saxitoxins (neurotoxins) have never been found. In the considered timespan, a progressive reduction of total microcystins concentrations in the euphotic layer has been observed: summer peaks declined from above 300 ng/L in 2010 to less than 20 ng/L in 2023 and 2024 (0 – 20 m mean values). The main microcystin variants were the demethylated ones, which are typical of *P. rubescens*. Anatoxins, instead, showed a contrasting trend: the highest value of anatoxin-a was recorded in summer 2018 (about 4,000 ng/L) while values below 30 ng/L were observed in 2023 and 2024 (0 – 20 m mean).