



The impact of toxic cyanobacteria on the water quality in the Deep Subalpine Lakes (DSL)

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Toxic cyanobacteria represent an emerging threat for aquatic ecosystems worldwide. Eutrophication and climate changes are mentioned among factors favouring toxic blooms. The toxicity of cyanobacteria is related to the ability of some species (the most common in temperate waters belong to the genera *Microcystis*, *Planktothrix*, *Dolichospermum*) of producing a wide variety of toxic secondary metabolites, i.e. microcystins, nodularins, anatoxins, saxitoxins, cylindrospermopsins. Some of these toxins can accumulate in water and aquatic organisms. They can therefore produce severe effects on humans by direct exposure (contact or ingestion of contaminated water) or by indirect exposure (by consumption of contaminated food).

We have conducted a survey on the distribution of cyanobacterial toxins in the largest Italian lakes (Garda, Iseo, Como, Maggiore, Lugano), which are important water resources for drinking purposes and for recreational use. Cyanobacterial toxins were present in all lakes, although with a big variability in concentration. More specifically, in the frame of the European project EULAKES, we have investigated in detail the temporal dynamics of the toxin production in Lake Garda, and the mechanisms of trophic transfer of the microcystins along the lacustrine food chain. By applying advanced analytical techniques based on LC-MS technologies, we were able to detect several microcystins at sub-ppb level and follow their variations during the year. The total concentrations of microcystins were strictly linked to the temporal and vertical dynamics of *Planktothrix rubescens*. Laboratory experiments allowed us to determine the kinetics of microcystin accumulation in zooplankton (*daphnia magna*).