



## CYANOBACTERIAL TOXINS PROFILING IN THE ITALIAN SUBALPINE LAKES

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Cyanobacteria have a key role in all aquatic ecosystems. However, the presence of toxic strains of cyanobacteria can have negative impact on all water uses and can pose serious health risks for humans and animals. Toxic species belong mainly to the genera *Microcystis*, *Planktothrix* and *Anabaena*, which have the capability of producing toxic metabolites. Microcystins (MC) are the most abundant and dangerous toxins produced by cyanobacteria. They are cyclic peptides with hepatotoxic effect; they are also endowed with tumor promotion. In addition to MC, many other toxins are known, such as nodularins and the alkaloids anatoxins, saxitoxins and cylindrospermopsins. Although cyanobacteria are widespread in Italian lakes, very limited informations are available in the scientific literature about cyanotoxins distribution. We have determined the degree of variability and diversity of cyanobacterial toxins in a group of lakes located in the Italian subalpine region (Lakes Garda, Maggiore, Como, Iseo, Lugano, Idro, Pusiano, Ledro and Levico) which are characterized by the presence of diverse populations of cyanobacteria. We set up an analytical method based on LC-MS technology for the screening of twenty-one cyclic peptides and thirteen alkaloids. The results of the survey showed that microcystins were constantly present in all water bodies although with very different concentrations. The highest values were recorded in summer periods in connection with the highest development of cyanobacterial biomass. The different lakes were characterized by different microcystins variants; this aspect is very important from a management point of view since among the 70 and more microcystins variants, toxicities values span over a 2 orders of magnitude range. Four variants of microcystins were by far the most represented in all lakes.