

Lakes: The Mirrors of the Earth

BALANCING ECOSYSTEM INTEGRITY AND HUMAN WELLBEING

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Book of Abstracts of the 15th World Lake Conferences

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TOXIN DYNAMICS INSIDE THE RESIDENT CYANOBACTERIAL COMMUNITY OF LAKE GARDA (ITALY)

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Cyanobacteria have the ability to produce an extraordinary variety of secondary metabolites, some of which are toxic for humans. Massive developments (blooms) of these microorganisms represent a major concern in many natural and artificial water bodies, because of the high levels of toxins which can be potentially released in the water and eventually uptaken by humans (mainly by ingestion). Microcystins, potent hepatotoxins, represent the most frequent toxins produced by cyanobacteria. They show a big variability in chemical structure and, in fact, more than 90 variants have been reported. The chemical diversity has an impact on the toxicity, which differs substantially from variant to variant. The factors triggering the toxin production in cyanobacteria as well as the reasons of the wide chemical variability are still matter of debate. In order to elucidate the dynamics of toxin production inside a population of cyanobacteria, we have investigated the temporal and spatial variability of the microcystin diversity in the resident cyanobacterial community of Lake Garda. The lake, which represents the biggest water basin in Italy, was sampled on a monthly basis from 2009 till 2013. Toxin analysis, based on LC-MS/MS technique, was performed on phytoplankton samples taken at discrete depths in the trophogenic layer. The investigation showed a seasonal pattern of toxin production (with typical late summer-early autumn peaks) and a relatively constant toxin diversity (with five variants accounting for almost the totality of the microcystin content) with one variant ([D-Asp3]MC-RR) always dominating over the others.

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