MALDI-TOF AND Q-TOF MASS SPECTROMETRY CHARACTERIZATION OF A NEW MICROCYSTIN PRODUCED IN A CYANOBACTERIA BLOOM IN THE AVERNO LAKE

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Cyanobacteria (blue-green algae), occurring worldwide within water blooms in eutrophic lakes and drinking water reservoirs, produce several different biotoxins. Among these, Microcystins (MCs) are a group of cyclic heptapeptides showing potent hepatotoxicity and activity as tumour promoters. The general structure of MCs is cyclo (D-Ala-X-DMeAsp-Y-Adda-D-Glu-Mdha). X and Y are variable L-aminoacids that identify the biotoxin as MC-XY. At least 75 MCs from different cyanobacteria genera have been isolated and characterized. The occurrence of MC-containing blooms in freshwaters has been involved in several animal and human poisoning outbreaks worldwide. The analysis of MCs is of growing interest for water surveillance authorities because they can contaminate drinking water reservoirs or lakes intended to be used as recreational areas. Therefore, reliable analytical procedures should be available to public authorities to monitor and characterize cyanobacteria blooms on the basis of the biotoxins produced.

The characterization of the biotoxins produced by a bloom of *Planktothrix rubescens* in the Lake Averno, near Naples, using both Matrix-Assisted Laser Desorption/Ionization (MALDI) - Time-Of-Flight (TOF) and Q-TOF Mass Spectrometry (MS) is described. By MALDI-TOF-MS analysis it was possible to detect several compounds and three major substances. The analysis by Q-TOF/MS allowed Anabaenopeptin B and Anabaenopeptin F to be identified, while the third biotoxin could not. On the other hand, the study of the fragmentation pattern of the unknown compound proved that it was a Microcystin never describe before, thus allowing its complete molecular structure to be elucidated and recognized as a variant of MC-YR. The results of this work give new information about the algae biotoxins detectable in Italian lakes and improve existing knowledge on the contamination by cyanobacteria.