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EXPERIMENTAL MODELS OF MICROCYSTIN ACCUMULATION IN *DAPHNIA MAGNA* GRAZING ON *PLANKTOTHRIX RUBESCENS:* POTENTIAL FOR MICROCYSTIN TRANSFER THROUGH THE FOOD WEB

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The occurrence of toxic cyanobacteria blooms have been recognized as a world-wide phenomenon due to the eutrophication of the aquatic environment. Several cyanobacteria species have the ability to produce a wide variety of potent toxins (cyanotoxins): hepatotoxins (microcystins, nodularins), neurotoxins (saxitoxins, anatoxins, and BMAA), and specific protein synthesis inhibitors (cylindrospermopsins). Cyanotoxins have the potential to accumulate in aquatic organisms at different trophic levels. In Lake Garda, the filamentous cyanoabacterium *Planktothrix rubescens* is present. This species is potentially toxic because it is endowed with production of cyanotoxins, in particular of microcystins (MCs). In order to elucidate the potential transfer of MCs produced by *P. rubescens* through the food web, a set of laboratory experiments was carried out using *Daphnia magna* as model of the zooplankton population. *Daphnia magna* was chosen because large cladocerans have a key role in aquatic food chains feeding on primary producers. A set of experiments was conducted aiming at i) demonstrating the effective grazing of *D. magna* over *P. rubescens*, and ii) modelling the accumulation of MCs in *Daphnia*. We set up a series of *P. rubescens* cultures with different densities; *Daphnia* was added only in half of the cultures. We measured at fixed times the *P.rubescens* density, the microcystin concentrations in the water and in the Daphnids This way we could clearly detect the effect of the grazer on the *P. rubescens* populations and follow the accumulation of MCs in the Daphnids. In the experiments with the grazer, the density of *P. rubescens* decreased faster, confirming that *D.* magna is very active in grazing *P. rubescens*. As a consequence of the grazing, cyanobacteria filaments were accumulated and ingested by *D. magna*, with a significant increase of MCs inside the grazers. Models of toxin accumulation showed that, at low doses of MCs, the toxin accumulation was linear, while, at high doses, the toxin accumulation was exponential. Implications for the aquatic food webs and resource management in lakes of different trophic status will be discussed during the presentation.