

Effects of the irrigation with Microcystin contaminated water on the quality of carrots (*Daucus carota*)

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Cyanobacteria blooms are often found in freshwaters and may reflect the increased eutrophication of these environments. Microcystin-LR (MC-LR), mainly produced by *Microcystis aeruginosa*, is the most documented and studied cyanotoxin causing serious problems to human health. Contaminated waters are commonly used for agriculture purposes and may represent a risk to food safety and crop's quality. The plant root system is usually more exposed via soil irrigation, and therefore, root-vegetables are more predisposed to contamination. Is important to evaluate the possible negative effects of the use of water containing MC in the physiology and quality of carrots (*Daucus carota*) due to its importance for human nourishment and economy.

For this purpose young carrots (~ 1 month old) were grown in soil during 1 month in environmental conditions (room temperature and natural photoperiod). Three groups were performed with plants being irrigated with non-contaminated water (control) or with a crude *M. aeruginosa* extract containing respectively with 10 and 50 µg/L MC twice a week. Evaluation of physiological conditions were accessed through quantification of the growth parameters (fresh and dry weight of roots and leaves) and evaluating the maximum efficiency of photosystem II, evaluated by pulse amplitude modulation (PAM). The nutritional quality of the carrots was also studied by quantifying the macro (AAS and spectrophotometry) and micro minerals (ICP-MS) content.

The results showed that *M. aeruginosa* crude extract did not produced toxic effects in *D. carota*, under conditions of prolonged exposure at environmental concentrations of the toxin. Additionally, the results showed that both short and prolonged exposure to MC increases photosynthetic efficiency of plants. It was also possible to observe alterations in the mineral content of the crops. The observed alterations may have consequences on the nutritional value of the carrots or even toxic implications thus requiring further clarification.

Palavras-Chave/Palabras Clave: Agricultural crops, cyanotoxins, *Daucus carota*, *Microcystis aeruginosa*, Microcystin-LR