Abstract

The aim of this *diploma* thesis is to explore the coagulation phase in water treatment process from two perspectives, the removal of cyanotoxin microcystin and the responses of ecotoxicological indicator species *Daphnia magna* to different concentration of this toxin, contained in a sample of cyanobacterial water bloom, which was extracted from a dam and was dominated by cyanobacteria *Microcystis aeruginosa*. The sample was administered in three environmentally relevant concentrations to 6 clones of *Daphnia magna*, 3 of which had previous experience with *M. aeruginosa*. Coagulation process was performed under optimal conditions: pH = 6.36; $KNK_{4,5}$ = 0.26 $mmol.l^{-1}$; Fe = 0.162 $mg.l^{-1}$; DOC = 2.83 $mg.l^{-1}$ using 10 ml of 0.125M $NaHCO_3$ in two litres of ultrapure water. Individual forms of microcystin were detected in this ratio: 31.6 % MC-LR, 53.6 % MC-RR and 14.8 % MC-YR. The study has shown that under these conditions coagulation does not remove microcystin, e.g. the efficiency of the process is zero. In ecotoxicological study, with growing concentration of cyanobacterial mixture the negative impact on *Daphnia magna* increased. We have found interclonal variability in responses of *D. magna*, however, the previous experience with *M. aeruginosa* had no effect. With growing concentration of cyanobacterial water bloom, the clutches of *D. magna* were smaller and the mortality higher. It was demonstrated that cyanobacterial water flower can have a negative impact on zooplankton even in environmentally relevant concentrations.

Keywords: coagulation, ecotoxicological indicator *Daphnia magna*, microcystins, *Microcystis aeruginosa*