

ALTERATION OF PHYTOPLANKTON GROWTH BY SOME SELECTED ZOOPLANKTON SPECIES FOR THE APPLICATION IN BIOMANIPULATION

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Biomanipulation directly targets the aquatic food web and prevents the formation of harmful algal blooms (HABs) by reducing the rapid growth of phytoplankton. It can be done through planktivorous fish and/or zooplanktons, and in this research, zooplanktons were used to alter the growth of phytoplankton. In order to find a potential candidate for the application in biomanipulation, four zooplankton species viz. *Daphnia magna*, *Alona* sp., *Stenocypris* sp. and *Cyclops* sp. were used. Four phytoplankton species, *Monoraphidium* sp., *Mougeotia* sp., *Microcystis* sp. and *Aphanothece* sp. were used to investigate the suitability of the selected zooplanktons. Grazing ability of the zooplanktons was assessed individually and as a Mix Culture (MX). After the initial introduction of 40 zooplankton individuals (for the MX, 10 from each species) to pure cultures of phytoplankton, the number of phytoplankton cells in 1ml was counted using the Sedgwick Rafter cell, weekly for 12 weeks. According to Pearson coefficient of determination (R^2) and probability values (p), individual zooplankton species and the MX demonstrated varied grazing abilities. *Mougeotia* sp. was controlled well by *Stenocypris* sp. and the MX was less effective. The growth of *Monoraphidium* sp. was greatly suppressed by *Daphnia magna*. *Stenocypris* sp. and *Microcystis* sp. were well controlled by MX and also by *Daphnia magna* and *Stenocypris* sp. For the control of *Aphanothece* sp. both *Daphnia magna* and the MX can be used. In this study, large-bodied zooplanktons, *Daphnia magna* and *Stenocypris* sp., exhibited a better grazing potential against other two species. The MX of zooplanktons should be experimented further in order to get more promising results for controlling phytoplankton. These different capabilities of grazing in zooplankton can be used to construct a suitable composition for the MX by considering phytoplankton species present in a bloom. They can be used for the application of biomanipulation in lentic freshwater systems in the near future.

Keywords: Biomanipulation, Freshwater systems, Harmful Algal Blooms, Phytoplankton Growth Alteration, Zooplankton Grazing