

## UNIVERSITY OF HELSINKI

Faculty Faculty of Science		Department Department of Ecology and Systematics, Division of Hydrobiology	
Author Jonna Mikaela Engström			
Title Copepod and rotifer feeding interactions with cyanobacteria			
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<p>Abstract</p> <p>Several characteristics of cyanobacteria, like morphology and toxicity make them hard for zooplankton to utilize efficiently. Rotifers have been found to ingest both toxic and non-toxic cyanobacterial species. Some copepod species are highly selective and avoid toxic strains. This study wanted to solve whether the common rotifer <i>Synchaeta baltica</i> and the copepod nauplii <i>Eurytemora affinis</i> and <i>Acartia bifilosa</i> graze cyanobacteria, <i>Nodularia spumigena</i> and <i>Aphanizomenon flos-aquae</i> and whether these cyanobacteria interfere with the uptake of eukaryote phytoplankton considered as "good food". Finally, I conducted a toxicity experiment to check the rotifer susceptibility to the cyanobacteria we used in the experiments.</p> <p>Algal cultures were used and zooplankton was sampled with a 50 µm mesh net in the Tvärminne archipelago at the southwest coast of Finland. Experiments were conducted at four concentrations of cyanobacteria, "full bloom", 50, 25 and 5% of bloom. "Full bloom" concentration corresponded 4,200 particles ml<sup>-1</sup>. Cyanobacteria were labelled with radioactive carbon in advance. A flagellated chlorophycean, <i>Brachiomonas submarina</i> was labelled for experiments investigating cyanobacterial impact on grazing eukaryote phytoplankton. Grazing was measured as cleared volume per individual, µl ind.<sup>-1</sup> h<sup>-1</sup>. Filtrates of algal cultures were used in the toxicity experiment.</p> <p>Clearance rates of copepod nauplii grazing on <i>Nodularia</i> and <i>Aphanizomenon</i> were significantly decreasing with increasing cyanobacterial concentrations. Our hypothesis predicted that high densities will depress clearance rates above the ILC (incipient limiting concentration). Clearance rates of <i>Synchaeta baltica</i> grazing on <i>Nodularia</i> were significantly increasing with increasing cyanobacterial concentrations. This result suggests that cyanobacteria were primary food for rotifers, but long manipulation times were exhibited as clearance rates were low. Copepod nauplii and <i>Synchaeta baltica</i> did not prefer flagellated chlorophyceans to cyanobacteria. <i>Nodularia</i> did not either interfere significantly with grazing on <i>Brachiomonas</i>. Both these results were contrary to our predictions. In the toxicity experiment ratio dead : live individuals differed significantly from control in 50% of the cyanobacterial replicates which gives an indication of a toxic cyanobacterial effect. To conclude, grazing is of minor importance in the fate of the Baltic on cyanobacterial species.</p>			
Key words grazing, clearance rate, nauplius, rotifer			
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