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SPRINGTIME PHYTOPLANKTON DYNAMICS AT A MONITORING SITE IN THE KONGSFJORDEN (SPITSBERGEN)

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The hydrographic properties of the Kongsfjorden – Krossfjorden system (79°N, Spitsbergen) are affected by Atlantic water incursions as well as glacier meltwater runoff. In the present study we tested the hypothesis that glaciers affect phytoplankton dynamics as early as the productive spring bloom period. During two campaigns covering late spring and early summer we studied hydrographic characteristics and phytoplankton variability along 2 mini-transects in both fjords, using HPLC derived pigment fingerprinting followed by CHEMTAX, molecular fingerprinting (DGGE) and sequencing of 18S rDNA. The sheltered inner fjord locations remained colder during spring as opposed to the outer stations. Vertical light attenuation coefficients increased from early spring onwards, at all locations, but in particular at the inner locations. During the end of spring, meltwater input had stratified surface waters everywhere, although decreased surface salinities were observed much earlier. The outer fjord and mid Kongsfjorden location showed on average higher chl *a* levels as compared with the inner fjord locations. Based on HPLC-CHEMTAX, diatoms and *Phaeocystis* sp. were replaced by small nano- and picophytoplankton during late spring, coinciding with low nutrient availability. The innermost stations showed higher relative abundances of nano- and picophytoplankton throughout, notably of cyanophytes and cryptophytes. Molecular fingerprinting revealed a high similarity between inner fjord samples from early spring and late spring samples from all locations, while outer samples from early spring clustered separately. Sequence data were dominated by clones related to *Alveolata* (*Dinophyceae*, *Syndiniales*, and *Ciliophora*), followed by *Haptophyceae* (mostly *Phaeocystis* spp.), Stramenopiles (mostly *Bacillariophyta*) and *Viridiplantae* (e.g.*Mantionella squamata*). We conclude that glacier influence, mediated by early meltwater input, modifies phytoplankton biomass and composition already during the spring bloom period, in favor of low biomass and small cell size communities. This may affect higher trophic levels especially when regional warming further increases meltwater period and -volume.