Effects of iron fertilization on the picoplankton composition in the Southern Ocean

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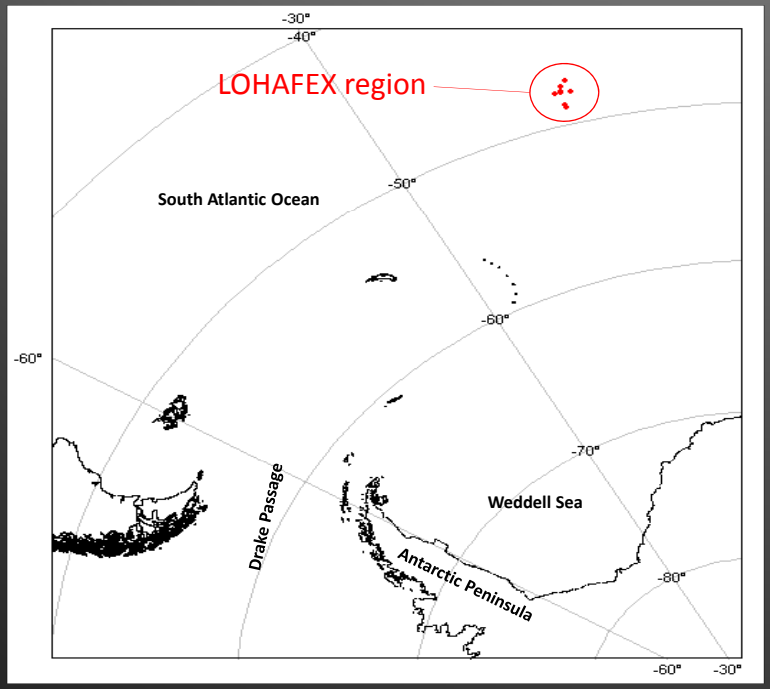
Scientific goal

The objective of this study is to determine the composition and succession of the eukaryotic picoplankton fraction during the LOHAFEX iron fertilization experiment. To achieve this goal the samples were analyzed with two molecular approaches, 18S rDNA clone libraries and amplification of the ITS1 region.

Introduction

- In the presence of silicic acid ocean iron fertilization experiments have induced diatom blooms that promote carbon sequestration from the atmosphere
- During the RV *Polarstern* cruise ANT XXV/3, the iron fertilization experiment LOHAFEX was carried out from January to March 2009 in an eddy in the Atlantic sector of the Southern Ocean
- At the start of the fertilization the eddy was silicic acid limited
- The pico- and nanoplankton fraction dominated the phytoplankton assemblage during the experiment

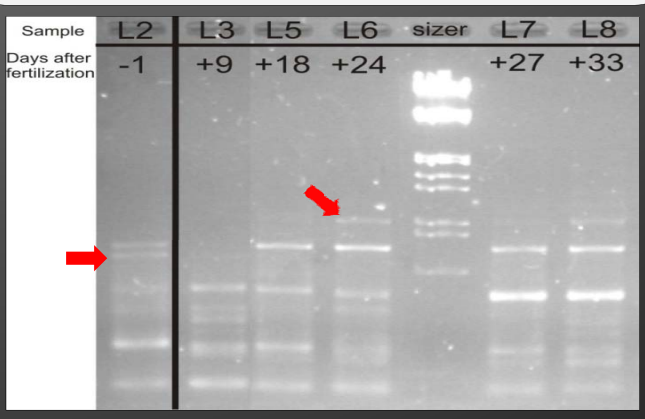


Location of the LOHAFEX region and the sample sites

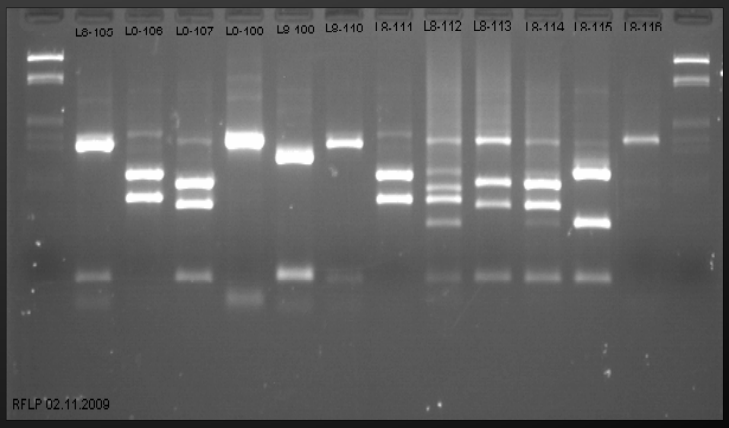
It is difficult to identify picoplankton down to the species level with conventional methods, thus we apply molecular approaches

Preliminary results

- Amplification of ITS1 region indicates changes in the composition of the eukaryotic picoplankton community during the fertilization experiment (presence or absence of bands ➡)
- Two hundred clones of one 18S rDNA clone library have been analyzed with RFLP and 45 different operational taxonomic units (OTU's) could be identified



Band pattern from the ITS approach



RFLP band pattern example

Outlook

- Amplification of the ITS1 region suggests that iron fertilization could influence the eukaryotic picoplankton composition
- Further the Amplification of the ITS1 region and number of OTU's found in one sample suggest a generally high diversity in the eukaryotic picoplankton fraction

→ Sequencing of 18S rDNA clone libraries will provide more information on species composition and the influence of iron fertilization

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