



Nanoflagellate diversity during the iron fertilization experiment LOHAFEX



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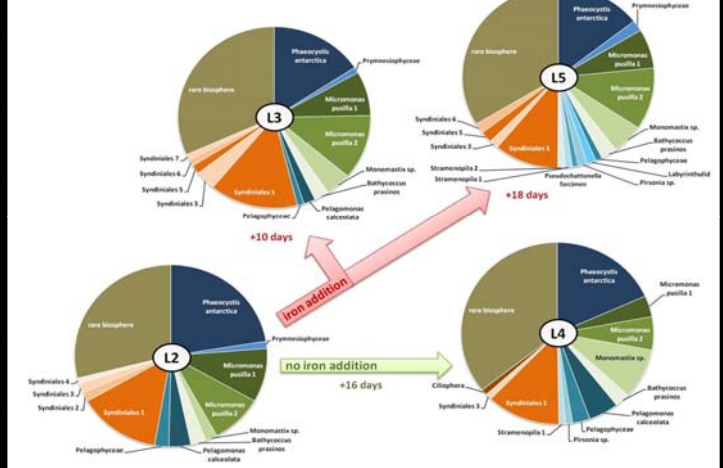
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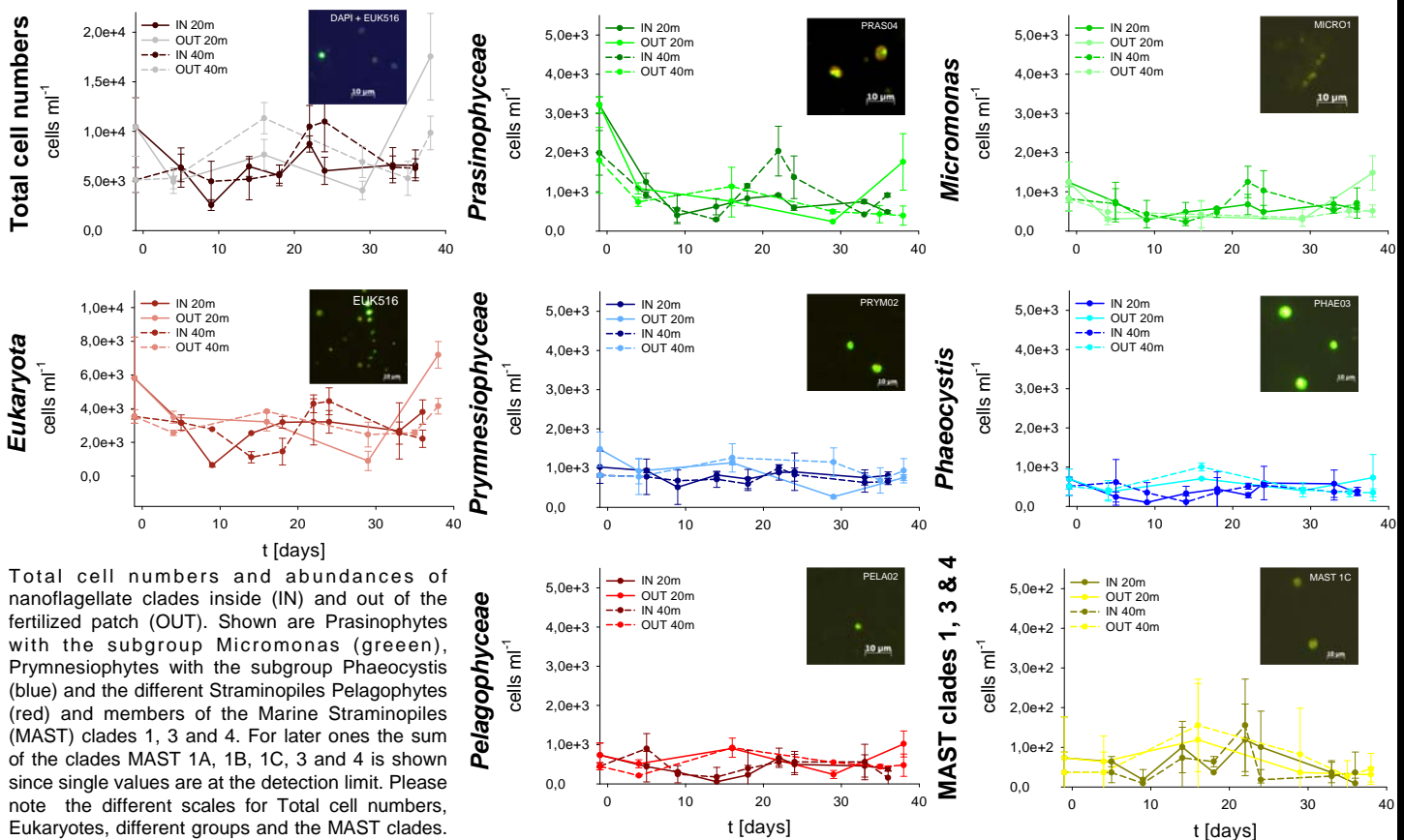
Background

- Iron fertilization in iron limited but nutrient rich areas leads to phytoplankton blooms.
- During LOHAFEX, an iron fertilization experiment in the Southern Atlantic, a phytoplankton bloom of mainly nanoflagellates (NF) was induced.
- The bacterial community within the bloom was top-down controlled by heterotrophic nanoflagellates.
- Autotrophic nanoflagellates play a role as primary producer in marine systems, whereas heterotrophic nanoflagellates (HNF) graze upon *Bacteria* and *Archaea* of a size range between 1 μm and 3 μm . Mixotrophic organisms are phototrophic and ingest bacterial prey at the same time.

Diversity using 454 Pyrosequencing



Nanoflagellate abundances using CARD FISH



Total cell numbers and abundances of nanoflagellate clades inside (IN) and out of the fertilized patch (OUT). Shown are Prasinophytes with the subgroup *Micromonas* (green), Prymnesiophytes with the subgroup *Phaeocystis* (blue) and the different Straminopiles *Pelagophytes* (red) and members of the Marine Straminopiles (MAST) clades 1, 3 and 4. For later ones the sum of the clades MAST 1A, 1B, 1C, 3 and 4 is shown since single values are at the detection limit. Please note the different scales for Total cell numbers, Eukaryotes, different groups and the MAST clades.

Conclusions

- Higher nanoflagellate abundances at 40 m depth compared to 20 m depth.
- Increase of *Micromonas*, an autotrophic prasinophyte, after the second iron fertilization (day 18) at day 22, followed by a decrease in abundance due to predation.
- Remarkably stable community, pointing towards overall top-down control by heterotrophic predators, e.g. dinoflagellates.