



# Nanoflagellate diversity during the iron fertilization experiment LOHAFEX



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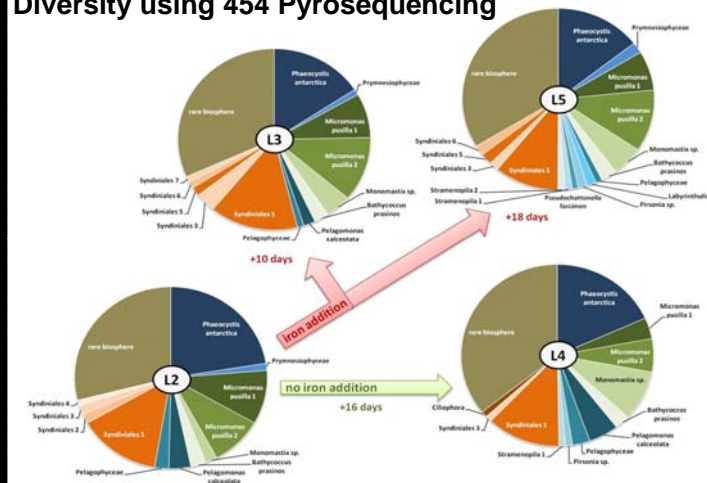
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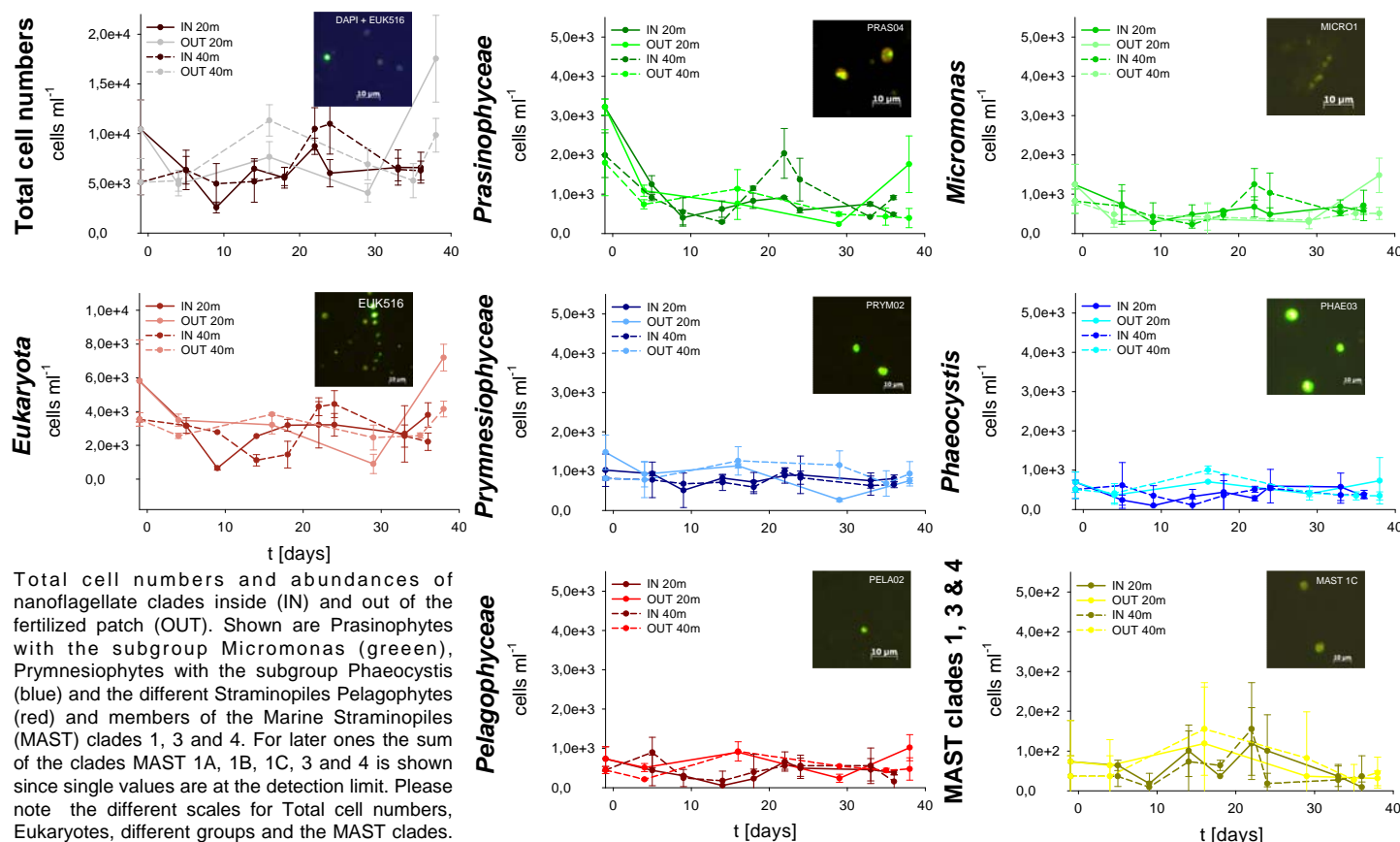
## Background

- 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  $\mu\text{m}$  and 3  $\mu\text{m}$ . 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 Stramenopiles *Pelagophytes* (red) and members of the Marine Stramenopiles (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.