

## 8. THE ROLE OF PROTISTS IN THE FOOD WEB OF THE ARCTIC OCEAN M. Wengert, S. Zitzmann

### Objectives

Despite of intensive investigations of the abundances and seasonality of pelagic protists in the Arctic Ocean, the functioning and the role of protists in this ecosystem is poorly understood. As we know from studies in other aquatic systems the impact of heterotrophic protists to the carbon cycling is large. Furthermore protists are highly species-specific within their trophic relationship. The aim of our investigation is to estimate the role of heterotrophic protists as herbivores (ciliates) and bacterivores (flagellates) in the aquatic food web of the Arctic Ocean.

### Work at Sea

We conducted two types of experiments, a "dilution experiment" and a "tracer experiment", to investigate the role of protists in the arctic ecosystem. The "dilution experiment" should show the grazing pressure from heterotrophic protists on algae, hetero- and autotrophic protists. Therefore natural unfractionated seawater was diluted with particle-free seawater in several steps to reduce the encounter probability between predator and prey. The bacterivory is given by the "tracer experiment". Labelled bacteria (fluorescently-labelled, FLB) were offered as food source for heterotrophic protists. The magnitude of bacterivory will be deduced from the difference in the abundance of the tracer between initial to the end samples. Both types of experiments were incubated under in-situ conditions in two seawater through-flow on-deck incubators for 48 h. The two types of experiments were performed seven times with different water masses from 20 to 35 m depth. To investigate the abundance of bacteria and the bacterivory, filters were made and frozen.

### Preliminary results

Only test-counting took place on board. It resulted, that the bacterial abundance of natural seawater was between  $0,2-0,89 \cdot 10^6$  bacteria/ml. This abundances correlate with bacteria concentrations found in the literature. To estimate the abundance of ciliates and algae fixed water samples are taken. The main evaluation will occur at the AWI and include:

- Determination of abundances of autotrophic and heterotrophic protists and bacteria
- Taxonomic description of the organisms
- Determination of concentration of chlorophyll a
- Determination of concentration of nutrients
- Determination of community growth rates
- Determination of community grazing rates
- Determination of species-specific growth rates
- Determination of species-specific grazing rates
- Direct quantification of bacterivory.