

## PHYSIOLOGICAL ASPECTS OF *MELOSIRA ARCTICA* (BACILLARIOPHYCEAE) LIFE CYCLE

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The diatom algae *Melosira arctica* grows meter-long filaments, anchoring in troughs and depressions under ice floes and covering up to 40 - 80% of the underside of undisturbed ice floes. Despite of substantial literature evidence of *M. arctica* colony distribution in the Arctic region much less is known about its physiology and the contribution to the global carbon cycle.

The Literature about the previous studies of *Melosira arctica* has been analyzed and standard methods of diatom observations in the laboratory were tested for this species. Laboratory experiment with the culture of *Melosira arctica* has been organized. The applicable methods for the *M. arctica* studying have been shown. For the first experiment four approaches were tested: light microscopy cell count, optical density measurements, chlorophyll *a* measurements and pulse-amplitude modulation (PAM) fluorescence measurements. Chlorophyll *a* measurements and direct light microscopy counting were shown to be the best methods for the *Melosira arctica* studies. PAM measurement results were somewhat unclear – there was a discrepancy between the statistics and the graphs. The optical density measurements proved worst for estimating culture growth. As the photosynthetic effectiveness was decreasing due to aging of the culture the total Chl *a* cell quota was rapidly growing.

*Melosira arctica* growth under different temperature conditions was studied during the experiment. Four replicates of -2°C, 0°C, 5°C and 8°C were set. The temperature test showed that the 5°C was the optimum for that species while the -2°C demonstrated the minimum growth and the chlorophyll *a* production.

The results of *Melosira arctica* growth have been compared with the peculiarities of the laboratory studies of centric diatom *Thalassiosira pseudonana* Hasle and Heimdal

A brief overview of the additional methods which could be investigated in future studies has been done.