Project information

Keywords
Pelagic-benthic coupling, zooplankton, vertical flux, Balsfjord

Project title
Marine snow, pelagic-benthic coupling and the impact of the harpacticoid copepod Microsetella norvegica, and other agents in a high-latitude fjord (MICROSNOW)

Year
2018

Project leader
Camilla Svensen

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
69,22N and 19,06 E

Participants

Camilla Svensen, Fredrika Norrbin, Ingrid Wiedmann, Coralie Barth-Jensen (UiT),

Jofrid Skardhamar (IMR),

International partners: Marja Koski (DTU-Aqua), Morten Iversen (AWI), Klas Ove Müller (Hamburg)

Flagship
Fjord and Coast

Funding Source

Fjord and Coast Flagship

Summary of Results

We found that *M. norvegica* dominated the copepod community in Balsfjord and was associated with marine snow and krill faecal pellets in the surface layer. The measured vertical flux of organic matter decreased with depth, likely due to copepod remineralization processes. We describe for the first time how *M. norvegica* searches for marine snow, and grazing experiments confirmed feeding on marine snow particles and krill faecal pellets. Egg-hatching rates for *M. norvegica* was investigated for 5, 8, 11 and 14 C, and the optimal temperature was 8 C. Respiration rates demonstrated a strong increase with temperature.

Master and PhD-students involved in the project

PhD student: Coralie Barth-Jensen

MSc thesis 2018: Peter Glad: Seasonal occurrence of *Oithona similis* (Cyclopoida), *Microsetella norvegica* (harpacticoida) and *Microcalanus* spp. (calanoida), and productivity of *O. similis*, in three high-latitude Norwegian fjords, MSc-thesis, UiT the Arctic University of Norway, May 2018 (Supervisors C. Svensen and C. Barth-Jensen).

Exchange students involved:

Julie Larcher, exchange BSc from CNAM-Intechmer, France May-June 2018. Supervisor C. Svensen

Quentin Bernier, exchange MSc from University of La Rochelle, France April-June 2018. Supervisor F. Norrbin

For the Management

Microsetella norvegica is a small pelagic crustacean. Due to its tiny size it not adequately sampled with common plankton nets. Using a combination of sampling methods, we discovered that *M. norvegica* is the most abundant copepod species in Balsfjord during summer, and also highly abundant in other high-latitude fjords. We demonstrated that *M. norvegica* feed on sinking particles (marine snow and faecal pellets), and that it is sensitive to changes in temperature. We suggest that *M. norvegica* is a key-species in high-latitude fjords, and that it may impact the efficiency of biological pump. Its reaction to increased temperatures still needs to be resolved in order to assess the impact of climate change on this species.

Published Results/Planned Publications

Kubiszyn, A. M. and Svensen, C. (2018) First record of a rare species, *Polyasterias problematica* (Prasinophyceae), in Balsfjord, northern Norway. *Bot. Mar.,* **61,** 421-428.

Svensen, C., Antonsen, M. T. and Reigstad, M. (2018) Small copepods matter: population dynamics of *Microsetella norvegica* in a high-latitude coastal ecosystem. *J. Plankton Res.,* **40,** 446-457.

Planned publications:

Svensen et al. The role of *Microsetella norvegica* for the regulation of the biological pump in a high latitude coastal ecosystem

Communicated Results

Conference Presentations:

C Svensen, M Iversen, M Koski, I Wiedmann, F Norrbin, J Skardhamar, C Barth-Jensen. Is the Tiny Copepod *Microsetella norvegica* a Gatekeeper for the Biological Carbon-Pump? Ocean Sciences meeting, Portland, USA 11-16 February 2018 (**Oral contribution**)

C Barth-Jensen, C Svensen, P Glad, U Grote. Temperature-dependent Egg-hatching and Production of the Egg-carrying Copepods *Microsetella norvegica* and *Oithona similis* in a High Latitude Fjord. Ocean Sciences meeting, Portland, USA 11-16 February 2018 (**Oral contribution**)

Outreach:

September 2018: Participation in the national Science days (Forskningsdagene, tema oppvekst) demonstrating copepod age determination to local school classes (C. Svensen)

September 2018: Teaching marine science to high-school students visiting from the Netherlands (C. Barth-Jensen).

Interdisciplinary Cooperation

In MICROSNOW we combine physical oceanography, biological field studies and experiments.

Budget in accordance to results

Yes, but we are dependent on the final year of funding to complete analyses.

Could results from the project be subject for any commercial utilization

No

Conclusions

To be provided after the final year