

Project information

Project title

Trophic interactions in pelagic ecosystems

Year

2012/2013

Project leader

Tove M. Gabrielsen, UNIS

Participants

- Tove M. Gabrielsen (The University Centre in Svalbard) – project leader
- Jørgen Berge (The University Centre in Svalbard and University of Tromsø)
- Janne E. Søreide (The University Centre in Svalbard)
- Stig Falk-Petersen (Norwegian Polar Institute and University of Tromsø)
- Claudia Halsband (Akvaplan-niva)

Flagship

Fjord and Coast, Theme: Structure, function and change in Arctic and boreal fjord ecosystems

Funding Source

400 000 NOK was allocated from Flagship funding for 2012. Additional funding for fieldwork has been received from Arctic Field Grants. The field work has been performed in collaboration with (and partly funded by) the UNIS-led projects MicroFun, CircA and CleopatraII.

Summary of Results

The main aim for 2012 in this project, was to develop the molecular methodology to genetically identify prey in calanoid copepod guts. In addition, 2012 was utilized to sample calanoid copepods throughout a whole year in the Isfjorden system (utilizing our ongoing Adventfjorden fieldcampaign; http://www.unis.no/20_RESEARCH/2020_Arctic_Biology/AFC.htm).

The main challenge in developing molecular genetic tools to identify prey in zooplankton guts or from whole animals is to avoid the pcr (polymerase chain reaction) amplification of DNA from the copepod. In addition, it is important to avoid amplification of DNA from organisms that may be attached to the exoskeleton of the copepod. In order to avoid these problems, a blocking primer to inhibit the amplification of copepod DNA must be developed. During the methodical development of the project in 2012, we designed several blocking primers that have been tested in our lab this autumn. In parallel with our tests, we were approached by Edward Durbin (Prof at Rhode Island State University) whose group has already developed blocking primers for *Calanus* and *Pseudocalanus* (not yet published) that he was willing to share with us. We thus decided to focus on testing the Durbin blocking primers for *Calanus* rather than developing our own. We are currently in the process of testing these primers, and will utilize them in a test of the feeding of *Calanus glacialis* from Billefjorden sampled beneath the sea ice in 2011.

Published Results/Planned Publications

The project is still in an early phase, focusing on developing, optimizing and testing methodology, and has thus not yet been presented anywhere.

Communicated Results

The project is still in an early phase, and has thus not yet been communicated.

Interdisciplinary Cooperation

The project has benefitted from the ongoing interdisciplinary collaboration between physical and chemical oceanographers and marine biologists of the Adventfjorden Field Campaign (see link above).

Budget in accordance to results

The funding from the Fram Centre has allowed us to focus on developing the methodology to genetically identify the prey of *Calanus* in a seasonal perspective. We originally applied for 1.6 mill over two years for this project, and the funding that was made available for 2012 (400 kNOK) allowed us to initiate the project and will allow us to identify the prey of *Calanus glacialis* in two different seasons (late spring vs. min bloom) under the sea ice. It will also allow us to test to what degree the species will feed on the *Phaeocystis* bloom that developed in Billefjorden in 2011, and the results from this study should be available early next year. We will, however, require further funding in 2013 to be able to accomplish the original aims of the project to analyse the whole-year samples of calanoid copepods that we have been collecting in Adventfjorden in 2012 including polar night samples.

Could results from the project be subject for any commercial utilization

No

Conclusions

- a) The project results will allow us to identify the prey of *Calanus* throughout the year, and thus help us to answer the question of why calanoid copepod species retain high activity levels throughout the polar night. The project has also led to a fruitful collaboration with Prof. Durbin, which has again led to a joint NSF grant proposal on zooplankton feeding.
- b) Blocking primers to block the amplification of zooplankton to enable us to identify prey in zooplankton guts are being optimized and tested. These can most likely be utilized also for other species than calanoid copepods.