

Impact of oil discharges on light- and temperature-adapted behaviour in the marine calanoid copepod *Calanus finmarchicus* - Impact of oil discharges on light- and temperature-adapted behaviour in the marine calanoid copepod *Calanus finmarchicus* - Biannual report 2011

by [Cecilie Miljeteig](#) — last modified 2011-07-25 15:24

History

Action	Performed by	Date and Time	Comment
Submit Report	Cecilie Miljeteig	2011-07-25 15:24	No comments.

Project title: Impact of oil discharges on light- and temperature-adapted behaviour in the marine calanoid copepod *Calanus finmarchicus*

Project director: Jenssen, Bjørn Munro, NTNU (Dept. Biology)

PhD scholar: Miljeteig, Cecilie

Project duration: 27.04.09 – 26.04.12

Technical contact person in Statoil: Frost, Tone Karin

Division head: Collin-Hansen, Christian

Project number: 6156

Object

The calanoid copepod *Calanus finmarchicus* is considered a key species in the North Atlantic ecosystem. *C. finmarchicus* generally perform diel vertical migrations, staying deeper in the water during day than during night. This activity is assumed to be at least partly guided by environmental light cues. Organic pollutants may interfere with important behavioural traits, such as migration. The *C. finmarchicus* population along the Norwegian coast and in the Barents Sea is exposed to varying concentrations of oil components. Furthermore, organisms in their natural environment are exposed to several different types of stressors (temperature, nutritional stress, predation risk) in addition to the exposure to chemical pollution. The objective of the current project is to investigate the phototactic behaviour of *C. finmarchicus* and the effects of oil exposure on this behavioural response, with exposure to oil alone and in

combination with additional stressors, such as temperature, nutritional status and predator cues.

Status:

An experimental method for detecting copepod behaviour in response to light in a simplified horizontal setup has been developed. With the method we are able to detect copepods down to a size of ~3mm in a 50 cm long aquarium in complete darkness using near infrared light sources and near infrared sensitive camera. The setup was tested with *Calanus finmarchicus* in September and October 2010, when an experiment investigating the light conditions needed to elicit a response to white light in three life stages of *C. finmarchicus* (CV, males and females). The results from this experiment are being processed.

In collaboration with a PhD scholar, Anna Båtnes, at the Department of Biology, NTNU, experiments were conducted in Longyearbyen, Svalbard in January 2011 on *Calanus* caught in Adventfjorden. The preliminary results indicate a similar response in wild caught *Calanus* compared to the cultured *C. finmarchicus*, and that light of different wavelengths elicit a behavioural response in *Calanus*.

In February/March 2011 an experiment was conducted which included established methodology on biometric measurements. The preliminary results show interesting relationships between the behavioural response to light and nutritional status. However, supplementary data is needed and is planned to be conducted later in the year. An experiment investigating the effect of exposure to the water accommodated fraction (WAF) of oil (Troll) on the behavioural response to light is planned to start up in August and will be conducted in August and September 2011. The conducting of experiments is somewhat delayed in comparison with the original plan. Firstly, getting the experimental setup developed and ready for use took longer than expected. Next, we experienced delays due to difficulties in timing the availability of the right stages (late stages, i.e. CV and adult males and females) of *C. finmarchicus* in the culture to times suitable for conducting experiments, e.g. not coinciding with coursework, fieldwork, other experiments, etc.

The PhD scholar has finished 100% of the required coursework.

Publications:

Miljeteig, C. Impact of oil on light-adapted behaviour in the marine copepod *Calanus finmarchicus*. Presentation 01.10.2009 in the Environmental Toxicology seminar series, NTNU.