

Project information

Keywords

copepod, *Acartia longiremis*, ocean acidification, transgenerational effects, reproduction

Project title

ECOAN WP2-OA4: Transgenerational effects of OA in arctic copepods

Year

2015

Project leader

Claudia Halsband

Participants

Dr Peter Thor (NPI)

Lauri Kapari (APN)

Carl Ballantine (APN)

Thor Arne Hangstad (APN)

Flagship

Ocean Acidification

Funding Source

Fram Centre flagship Ocean Acidification and own contribution (APN).

Summary of Results

This project is embedded in the ECOAN science program, which explores the potential ecological threats ocean acidification may pose for arctic marine organisms. Ocean acidification will expose arctic copepods to environmental conditions never experienced during their entire evolutionary history (Fabry et al., 2008), if at slow temporal scales. Predictions are presently hampered by a lack of knowledge on the long-term and transgenerational effects of OA. This is of particular importance in Arctic marine environments, where OA impacts are imminent. Knowledge on longer term effects in OA affected populations is, therefore, urgently needed. We aim to overcome this challenge through extended multigenerational studies, which enable estimates of transgenerational effects and connect the physiological results in WP2-OA3 with the panarctic perspective of evolutionary population effects in WP2-OA5.

This part of ECOAN was started as a new activity in 2015 in the Kraknes lab of Akvaplan-niva, near Tromsø. The main effort in this first year was on designing and

implementing an upgrade of existing ocean acidification facilities suitable for replicated long-term cultures of pelagic copepods. A total of 8 tanks with a volume of 90 litres each were mounted on a wooden rig and connected to a header tank and mixing tanks, where incoming seawater from the fjord (Sandnessundet) is mixed with CO<sub>2</sub> gas to achieve the desired pH (Fig. 1). New pH controllers were purchased to guarantee reliable and stable water chemistry.

Zooplankton was sampled in May near Håkøybotn with RV Hvas and brought to the Kraknes lab. Adult stages of *Acartia longiremis* were identified and sorted under a stereomicroscope (Leica MF 205). The sorted individuals were kept at ambient temperature (~10 degrees C) in 20 L buckets awaiting further processing. One batch was incubated in one of the incubation tanks and another batch to check for reproductive rates. Unfortunately, the egg production levels were too low and nauplii mortality too high to continue with the inoculation of cultures. This will therefore be repeated in spring 2016 during the reproductive peak.

#### Published Results/Planned Publications

No results have been published yet.

#### Communicated Results

No results have been communicated yet, but dissemination through AMAP, ICES/OSPAR Study group on OA and the OA International Coordination Centre (OA-ICC) is planned.

#### Interdisciplinary Cooperation

We plan to cooperate with other OA biologists, chemists and modellers within and beyond ECOAN and provide relevant data and relationships for ecosystem and population models, as well as socio-economic assessments.

#### Budget in accordance to results

Yes. Most of the funds were supporting salaries for Halsband, Hangstad, Capari and Ballantine. A student assistant was hired in the summer to help with copepod sorting and incubation. Some minor funding was used for purchase of equipment and consumables.

#### Could results from the project be subject for any commercial utilization

No

WP2-OA4 has implemented new experimental OA facilities in Tromsø to contribute valuable long-term data on copepod development and survival under OA conditions to the ECOAN program. The system is ready to receive new animals in spring 2016.