Geophysical Research Abstracts, Vol. 8, 06149, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06149

Selective grazing and calcite dissolution by zooplankton during the PeECE 2005 mesocosm experiment

K. Suffrian (1), A. N. Antia (1), J. C. Nejstgaard (2), P. Simonelli (2), Y. Carotenuto (3) S. Putzeys (4)

(1) Leibniz-Institut of Marine Sciences (IFM-GEOMAR), Düsternbrooker Weg 20, 24105 Kiel, Germany (2) Dept. Biology, Univ of Bergen, 5020 Bergen, Norway (3) Stazione Zoologica "A. Dohrn", Villa Comunale, 80121 Naples, Italy (4) Univ Las Palmas de Gran Canaria, Facultad de Ciencias Básicas 35010 Tafira Baja, Las Palmas

It is established that the oceans are becoming more acidified, but how this effects organisms living under these conditions still needs to be unveiled. We studied the effects of rising pCO_2 on the growth of calcifying algae, grazing by microzooplankton and copepods, and differences in Ca-dissolution induced by the digestion of calcifying algae in a series of experiments. This was a part of the Bergen PeECE 2005 mesocosm experiment using 20m^3 enclosures of fjord water, aerated with CO_2 to target concentrations at present (350ppmV) and future (750 ppmV and 1100 ppmV, respectively) pCO_2levels, each in triplicates.

Differential phytoplankton growth and selective grazing by microzooplankton were investigated in serial dilution experiments using HPLC analysis of algal pigments. Additional measurements of particulate calcium by ICP analyses were used to provide information on the dissolution of calcite caused by microzooplankton grazing. These data also provide information on temporal changes in the ratio between different algal groups and the over-all algal community within and between the different treatments.

Additional experiments were conducted to look at the grazing pressure by copepods and their growth and egg production rates as well as their contribution to calcite degradation. Feeding rates estimated by flow cytometry on fresh samples of smaller algae such as Synechococcus, *Emiliania huxleyi*, other nano- and picoflagellates, were low (between 0-0.3 d^{-1}). Likewise, copepod grazing was also generally very low on these small algae, generally not significantly different from zero, but the copepods fed upon

other prey (presumably the microplankton).

There was no apparent difference in the development of larger zooplankton between the different CO_2 treatments. The biomass of plankton caught in a 90 μm net at the end of the experiment, was virtually identical between all the 9 mesocosms. Likewise, females of the common copepod *Calanus finmarchicus* fed with water from mesocosms with 350 and 1100 ppmV pCO_2 levels, respectively, showed no significant difference in faecal pellet production (proxy for feeding activity), egg or nauplii production throughout the experiment. This indicates that the addition of CO_2 up to three times the present concentration had no salient effects on the feeding or growth of the mesozooplankton in these mesocosms.