

Effects of elevated $p\text{CO}_2$ on living benthic foraminifera -

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a field and laboratory study

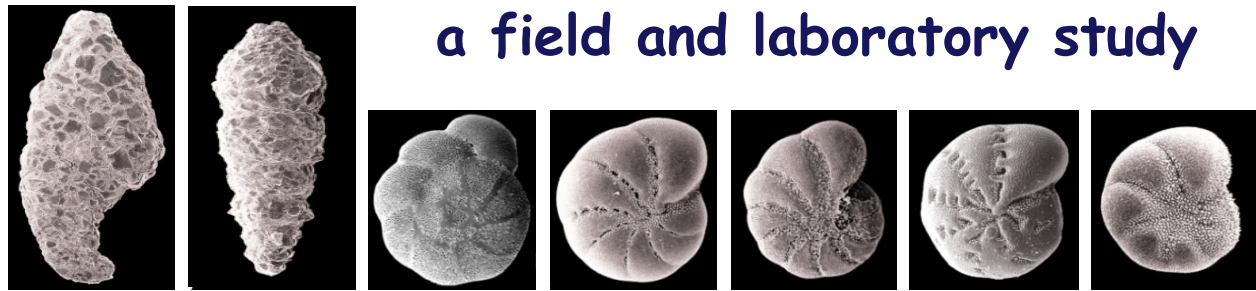


Fig. 1. SEM images of benthic foraminifera from Flensburg Fjord.

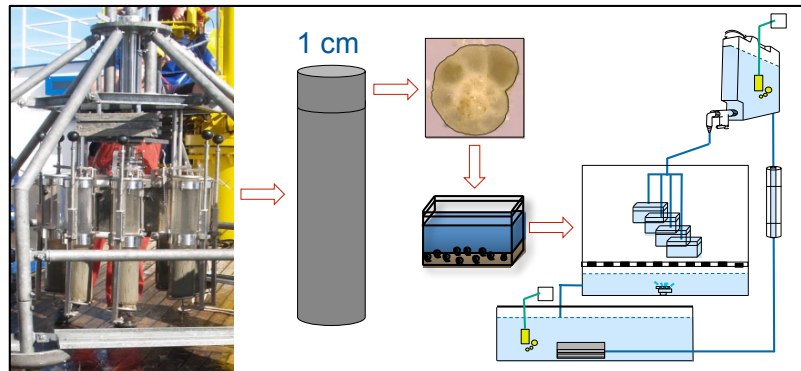


Fig. 2. Sampling and experimental setup for culturing *Ammonia aomoriensis*.

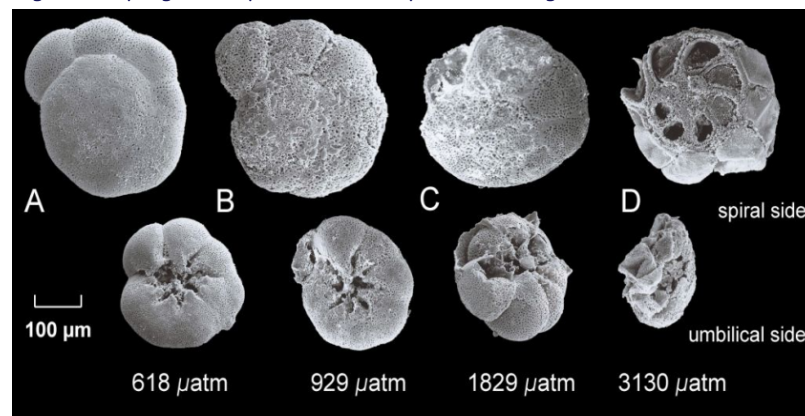


Fig. 3. SEM images of *Ammonia aomoriensis* indicate different dissolution stages that increase at higher $p\text{CO}_2$ in the cultures (A through D).

Laboratory studies revealed that rising $p\text{CO}_2$ values affect the calcification of benthic foraminifera in the world oceans. In comparison to the open ocean, the acidification at strongest affects foraminifera in near-coastal areas and estuaries, like the Baltic Sea and the Gulf of Paria.

Goals:

(1) To obtain a better understanding about the influence of changed CO_2 concentrations on the shell formation of single individuals from boreal and tropical *Ammonia* species as well as living assemblages in short and long-term experiments.

(2) Monitoring the faunal composition and population density of benthic foraminifera in a natural, CO_2 rich near-coastal environment in Flensburg Fjord in the course of one year.

Results:

Test solution was observed in living benthic foraminifera from Flensburg Fjord. The same solution phenomena were created in a laboratory experiment with elevated $p\text{CO}_2$ values from 929 to 3130 μatm . These results demonstrate that it is necessary to understand the factors influencing benthic foraminiferal carbonate production in detail on species, community and ecosystem levels.

Publication:

Haynert K, Schönfeld J, Riebesell U, Polovodova I (2011) Biometry and dissolution features of the benthic foraminifer *Ammonia aomoriensis* at high $p\text{CO}_2$. Marine Ecology Progress Series 432:53-67