



## **Effects of acidification on fertilisation success in free spawning marine invertebrates.**

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This pilot study examines the effects of CO<sub>2</sub> acidification on reproduction by marine invertebrates. *In vitro* fertilisation experiments are conducted across a range of predicted future atmospheric CO<sub>2</sub> concentrations to examine the sensitivity of reproductive success of two marine invertebrates to acidification by CO<sub>2</sub>. In these experiments, gametes are spawned directly into acidified water to avoid experimental artefacts caused by pre-maturation in normal sea water prior to transfer to acidified water. Preliminary observations are presented.

Disruption of fertilisation by marine invertebrates due to ocean acidification could fundamentally alter the nature of marine food webs with possible large scale, and detrimental, effects on a wide range of species including important commercially exploited and subsistence species.

Research carried out [1,2,3] on the role of pH (generally manipulated with HCl<sup>-</sup>) in regulating reproductive processes as part of general physiological studies on reproduction before the effects of ocean acidification were realised found that fertilisation is inhibited for all species examined at pH of 7.5 – 6.8. A single recent study [4] on the effects of CO<sub>2</sub> acidification on reproduction of two marine invertebrates found that fertilisation success was only reduced to 50% by pH 7.2, and that limited fertilisation still occurred at pH 6.8. The results of this study are contradictory to the findings by previous workers. However, in the recent study gametes were spawned into normal seawater prior to transfer to acidified seawater. This may have allowed the gametes to undergo essential maturation processes prior to transfer to the acidified water, thus failing to capture the full effect of acidification on fertilisation processes.

References:

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- [3] Holland, L.Z., Gould-Somero, M., Paul, M. 1984 *Developmental Biology* 103:333-342
- [4] Kurihara, H., Shirayama, Y. 2004 *Marine Ecology Progress Series* 271:161-169