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Testing the effects of pCO_2 on the coccolithophore *Emiliania huxleyi* during different growth stages

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Rising CO_2 concentration in the atmosphere leads to significant changes in seawater chemistry and potentially influences biological processes in the upper ocean. The coccolithophore *Emiliania huxleyi* is a key species in the marine carbon cycle and episodically forms massive surface blooms. Recent studies indicate that production processes in coccolithophores, such as calcification, are sensitive to changes in CO_2. However, the cell's sensitivity to pCO_2 at different growth stages is not well understood. We investigated the combined effect of pCO_2 and nutrient supply on organic matter production and calcification in *E. huxleyi* during a chemostat experiment. Prescribed CO_2 concentrations in 4 chemostat incubators were achieved by aeration with a gas mixture of CO_2 and of CO_2 free air ranging from low (180ppm) to high pCO_2 (1200ppm). Adjusting the medium flow rate between 0.5-0.1 d^{-1} allowed us to maintain the algae at different growth rates at steady state. Here, we present the initial results on the production of dissolved and particulate organic matter, cell growth, and calcification. We discuss potential implications for the future marine carbon cycle.