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Calcification response of *Emiliania huxleyi* to acidification under calcite and aragonite sea

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Coccolithophores, one of the most important pelagic calcifies, experienced various changes in Earth's climate and the geochemical composition of oceanographic conditions. The seawater Mg/Ca ratio oscillates between aragonite seas (>2) and calcite seas (<2), which with this strongly influences the biocalcification of coccolithophores. The influence of changes in ocean temperature and pH on biocalcification should not be underestimated either. Here, we propose to analyze the effects of both temperature and pH as well as Mg/Ca on coccolithophores.

In this study, we cultured Emiliania huxleyi (RCC963) under a range of Mg/Ca ratios (0.2, 1, 5), temperature (15°C, 21.5°C, 28°C) and pH (7.4, 7.8, 8.2) to evaluate the cell adaption and calcification sensitivity by measuring the growth rate(μ), Photosystem II efficiency (Fv/Fm), calcification rate and coccolith morphology. We have found that in calcite sea, E. huxleyi is more vulnerable to changes of temperature and pH than it is in the aragonite sea. The coccolith morphology also supports the different response to the Mg/Ca ratio variation where more malformed and incomplete coccoliths were observed with the decreasing of temperature and pH. Further exploration is needed to understand the multi-changes in environmental parameters in the distribution of Mg in coccoliths of E. huxleyi and morphogenesis.