

Ocean acidification influences on coral growth of temperate species

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Carbon dioxide concentration in the atmosphere has steadily increased since the industrial revolution due to burning of fossil fuel and will cause the global warming and ocean acidification. It will raise the ocean temperature around Japan and reduce the seawater pH and then it may bring serious threat to corals dwelling around Honsyu Island, Japan. Last year, our research group did temperature-controlled culture experiments of temperate coral species from the Pacific side of Honsyu Island of Japan under the present level of the partial pressure of CO₂ (pCO₂). But, synergetic effect of the global warming and ocean acidification on these corals has not been tested yet in detail. In this study, we focus on the how the different pCO₂ levels (past, present, and future) can influence skeletal growth of temperate *Acropora* coral species under the different temperature setting using a precise control system. This system was used to generate six different pCO₂ levels: (i) pre-industrial, ~300 μatm, (ii) present-day pCO₂, ~400 μatm, and at four near-future conditions, (iii) ~550 μatm, (iv) ~750 μatm, (v) ~1000 μatm and (vi) ~1200 μatm at three temperature conditions (17, 25, and 27 deg C). Our early results suggested a negative influence of higher pCO₂ levels on skeletal growth of temperate *Acropora* corals, but not so sensitive compared to tropical and subtropical *Acropora* corals.

Keywords: Ocean acidification, temperate coral, calcification, global warming