

Influences of ocean acidification on skeletal growth of temperate *Acropora* coral species around Japan

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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 increase the acidity of ocean waters, which directly threaten calcifying marine organisms such as reef-building scleractinian corals. Model-based study indicated that ocean acidification limits temperature-induced poleward expansion of coral habitats around Japan [1]. We examined how the different $p\text{CO}_2$ levels (past, present, and future) can influence skeletal growth of temperate *Acropora* coral species under the different temperature setting using a precise $p\text{CO}_2$ -controlled tank system [2]. This system was used to generate six different $p\text{CO}_2$ levels: (i) pre-industrial, $\sim 300 \mu\text{atm}$, (ii) present-day $p\text{CO}_2$, $\sim 400 \mu\text{atm}$, and at four near-future conditions, (iii) $\sim 550 \mu\text{atm}$, (iv) $\sim 750 \mu\text{atm}$, (v) $\sim 1000 \mu\text{atm}$ and (vi) $\sim 1200 \mu\text{atm}$ at two temperature conditions. Our results suggested a negative influence of higher $p\text{CO}_2$ levels on skeletal growth of temperate *Acropora* corals.

[1] Yara, Y., Vogt, M., Fujii, M., Yamano, H., Hauri, C., Steinacher, M., Gruber, N., and Yamanaka, Y. (2012) *Biogeosciences*, **9**, 4955-4968. [2] Ohki, S., Irie, T., Inoue, M., Shinmen, K., Kawahata, H., Nakamura, T., Kato, A., Nojiri, Y., Suzuki, A., Sakai, K., and van Woesik, R. (2013) *Biogeosciences*, **10**, 6807-6814.