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Effects of thermal and salinity stresses on coral calcification: approach by aposymbiotic and symbiotic primary polyps

Mayuri Inoue^{1*}, Akira Iguchi², Shinmen Kotaro¹, Sakai Kazuhiko², Atsushi Suzuki³, hodaka kawahata¹

¹AORI, the Univ. Tokyo, ²Univ the Ryukyus, ³GSJ, AIST

In order to better understand the effects of high thermal and low salinity stresses on coral calcification from the aspect of coral-algal symbiosis, aposymbiotic (lacking symbionts) and symbiotic coral primary polyps were experimentally exposed to several seawater temperatures (27 ~ 33 °C) and salinities (26 ~ 34 psu). Symbiotic polyps showed non-linear calcification responses to thermal stresses whereas aposymbiotic demonstrated linear increase of calcification responses according to the increase of temperature. Both aposymbiotic and symbiotic polyps showed the linear decreases of calcification rates according to the decrease of salinity. Our results suggest that future global warming might have positive and negative impact on coral calcification, and low salinity stress, which would be caused by increase of the frequency of local floods related to future climate change, would certainly decrease coral calcification despite the existence of symbiotic algae.

Keywords: coral polyp, growth rate, environmental stress, algal symbiosis