Long-term effect of eutrophication on the growth and photosynthesis of the reef-building corals stylophora pistillata and Acropora spp.

PE-12 Long-term effect of eutrophication on the growth and photosynthesis of the reef-building corals *Stylophora pistillata* and *Acropora* spp.

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Coral reefs worldwide especially those located near the coastline have been subjected to anthropogenic nutrient input, which generally increases the concentration of nitrogenous compounds in seawater. This is in contrast with the paradigm that coral reefs thrive best in oligotrophic waters. Other than the reproduction, however, little information has been available on the direct impact of eutrophication on coral physiology. In this study we show effects of eutrophication on the growth and photosynthesis of two branching reef-building corals: *Stylophora pistillata* and *Acropora* spp. grown under eutrophic conditions in a flow-through system over six months. Concentrations of NH_4^+ and NO_3^- in nutrient enriched seawater had been kept 100 and 40 times higher than in ambient seawater, respectively. The growth and photosynthesis of *S. pistillata* were negatively affected by nutrient enrichment whereas the effect on *Acropora* spp. was less significant. *S. pistillata* under nutrient-rich treatment showed visible bleaching during summer period. However this was not observed in the control treatment or in *Acropora* spp. *Acropora* spp. in nutrient enriched seawater showed higher photosynthetic activity in autumn and winter. Growth of *S. pistillata* was significantly higher in control treatment compared to nutrient treatment (33% and 150%, respectively). However, the difference in percentage of growth between control and nutrient-treated *Acropora* spp. was less significant (300% and 200%, respectively). *Acropora* spp. has grown to show prominently different colony morphologies in response to nutrient enrichments. Nutrient enriched coral exhibits larger polyps, longer tentacles and darker pigmentation. These results suggest that the response of reef-building corals against eutrophication varies among species. Eutrophication along with other environmental stressors may pose a synergistic impact on reef-building corals, especially for the coral species that are sensitive to the changes in seawater temperature.