Growth rate, survivorship and stress tolerance of primary polyps of Acropora digitifera infected with zooxanthellae of different genotypes

PG-6 Growth rate, survivorship and stress tolerance of primary polyps of *Acropora digitifera* infected with zooxanthellae of different genotypes

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The objective of this study was to examine the effects of zooxanthella genotypes on the growth rate and stress susceptibility of the coral *Acropora digitifera* during the early stages of development. Aposymbiotic primary polyps of *A. digitifera* were infected with zooxanthellae isolated from various hosts and their growth rate and survivorship were observed under different conditions. The rate of infection varied depending on zooxanthella genotypes. Clade A zooxanthellae isolated from the giant clam *Tridacna crocea* were most rapidly incorporated by the polyps and the algal density increased even under high temperature conditions, while homologous zooxanthellae (clade C) were incorporated only very slowly. The growth rate of the polyps was different among polyps harboring zooxanthellae of different types. The highest growth rate was observed in polyps harboring clade A zooxanthellae from *T. crocea*. The stress tolerance of primary polyps harboring the clade A zooxanthellae was higher than polyps harboring clade C zooxanthellae from the sea anemone *Aiptasia pulchella* or than uninfected polyps. Thus the clade A zooxanthellae from *T. crocea* appear most beneficial for primary polyps of *A. digitifera* and association with this zooxanthellae is expected to be predominant in the reefs. However, corals harboring clade A zooxanthellae are rare in the study site, where *T. crocea* is abundant. This is probably because suitable symbiont type is different between juvenile and adult colonies, and/or juvenile corals are more flexible with symbiont types than adult colonies. Another possibility is that clade A zooxanthellae were not selected by the coral because symbionts with a much faster growth rate than host may present a risk of parasitism for the host coral.