EFFECTS OF "EUTROPHICATION" ON THE SIZE
AND NUCLEUS OF SYMBIOTIC ZOOXANTHELLAE

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ABSTRACT

Zooxanthellae (Symbiodinium sp) from the giant clams, Tridacna maxima, were monitored for their responses to ammonium and phosphate addition in the field. Nutrient was added into ponded microatolls at every low tide using Nutrient Dispersal Units (NDUs) moored outside the atolls to reach final concentrations of 10μm for ammonium and 2μm of phosphate. Transmission electron micrograph showed that zooxanthellae size (as the maximum diameter) from nitrogen-treated clams was significantly smaller than those from other treatments (P<0.05). However, the cross-sectional area of the nucleus was not significantly affected by the treatment; it was relatively smaller than that of zooxanthellae from giant clams is influenced by relatively small changes in the concentration of nitrogen in the water column.

Key words : zooxanthellae, giant clams, nutrient enrichment

I. Introduction

Despite known as highly productive environment, coral reef ecosystem is also considered an environment with low concentration of nutrient. Therefore, the occurrence of eutrophication, which becomes an important problem world wide, would give significant impact not only to the corals, but also to the other organisms living in this habitat, such as giant clams. In the last few years, several scientists have attempted to investigate the effects of nutrient addition on the clams in the laboratory. The growth rate of clam, Hippopus hippopus, was about three times faster under nutrient enrichment (Solis et al., 1988). Similarly, Brainley et al. (1992) reported that the growth of two different classes of Tridacna gigas, were significantly improved by addition of dissolved inorganic nitrogen (DIN) into the surrounding waters. Ammonium and phosphate elevation also influences the biomass and shell calcification of giant clams. The total zooxanthellae density from T. gigas was significantly higher in