

Differential Symbiodiniaceae association with *Acropora humilis* coral while rearing in hatchery conditions

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Abstract

Several studies have reported that most coral-Symbiodiniaceae adaptation occurs when coral faces temperature stress. However, little is known about Symbiodiniaceae population, particularly during coral development in ex-situ conditions. This study provides the first investigation on the Symbiodiniaceae diversity and community change of reared *Acropora humilis* colonies captured in the hatchery system at Samae San Island, Gulf of Thailand. Coral sexual propagation techniques were conducted to produce the experimental coral colonies. The gamete of *A. humilis* showed a high fertilization rate of $98.48 \pm 0.34\%$. Nevertheless, the survival rate of reared coral from the early stage to 18-month-old is declining to $45.96 \pm 1.31\%$. *Acropora humilis* randomly acquired symbionts in early stages (1 to 3-month-old) from an environment associated with three genera (Symbiodinium, Cladocopium, and Durusdinium) and several Symbiodiniaceae lineages whereas the community structure was found stable with almost 100% harbored of Durusdinium D1 at 6 to 18-month-old. Reared coral's offspring was significantly different from Symbiodiniaceae species compared to wild parent colonies. These results indicated that coral was shown to change Symbiodiniaceae community composition during development under hatchery conditions. Knowledge of this study is important to understand the corals-Symbiodiniaceae association, the status of coral reef prediction, and coral conservation in Thailand.

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