



International Conference on Oceanography & Natural Disasters

August 21-23, 2013 Holiday Inn Orlando International Airport, Orlando, FL, USA

Comparative study of available spawning methods of the giant clam *Tridacna squamosa* (Bivalvia: Tridacnidae) in Makogai, Fiji

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Tridacna squamosa also known as the “fluted or scaly clam” is distinguished by its large, well-spaced scutes (scaly projections on the shells), maximum shell length of about 40cm, and has mantle which tends to be mottled in various mixes of green, blue, brown, orange and yellow. In this present study, the intra-gonadal injection of serotonin, heat stress, macerated gonads and hydrogen peroxide methods were compared to determine the best method of induced spawning in terms of lowest larval mortality rate. Broodstock were induced to spawn using the four methods. The gametes were collected, fertilized and stocked (10 larvae/ml) into larval rearing tanks to monitor percentage mortality of the different treatments. No spawning occurred in hydrogen peroxide treatment. Larvae were fed twice with the zooxanthellae were during the veliger stage (96 and 144 hours). The addition of zooxanthellae significantly decreased the mortality ($df\ 2, F\ 586.58, p\ 0.0$) in *Tridacna squamosa*. Initial mortality of the clams was significantly higher than before the first ($p\ 0.0$) and second addition ($p\ 0.0$) of zooxanthellae however there was no significant difference ($p\ 0.177$) between the first and second additions of zooxanthellae. The macerated gonads, heat stress, and serotonin methods of induced spawning differed significantly with mean value of ($6657.56 \pm 2766.527\%$), ($7355.56 \pm 3045.012\%$) and ($8979.56 \pm 3641.121\%$) respectively. High mortality in the veliger stage (48 post fertilization) may have been caused by bacterial infection. Addition of zooxanthellae was seen as an important procedure especially when feeding was not done in the hatchery phase of giant clam larvae production. Thus, the best method of spawning in terms of lowest mortality rate was macerated gonads followed by heat stress and serotonin respectively.

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