

Spawning and Larval Rearing of Giant Clams



Giant Clam Biology

- Protandric hermaphrodites
- Produce 10-100' s millions of eggs
- Eggs approx. 100 um
- Hatch to trochophore 12 hours
- Veliger in 2 days
- Pediveliger
- Metamorphosis 8-10 days.



What makes Giant Clams Different


Large eggs

Rapid settlement period

You do not have to feed giant clam
larvae



Broodstock

- This is the parent clam.
 - Clams must be in good physical condition to produce good gametes
 - Clams can be collected from the wild
 - Also kept in captivity either in the ocean or in tanks.
 - For MO they need to have good color
 - Clams from the ocean generally have the best “condition”
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Preparation for Spawning

- Use clean dry tools and containers
- Test your water source
- Filter all water to 1 um
- Work in a shaded place as much as you can
- Do not let water over heat
- Scrub and clean the clams before use (this is often used as an additional stressor)

Induced Spawning

- Spawning in the wild usually happens on the full and new moons.
- Heat stress
- Gonad extract
- Serotonin injection
- Often a combination is used.



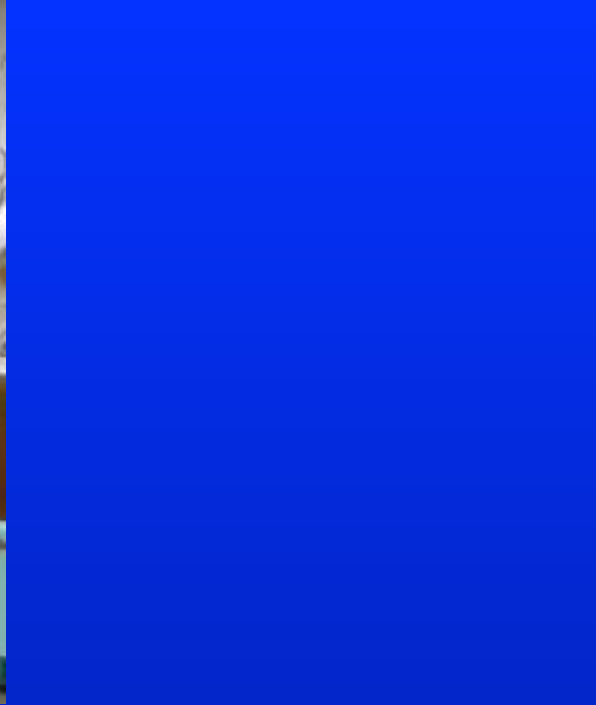
Spawning

- Clams release sperm first followed by eggs
- Gamete releasing clams are placed in individual containers until spent
- Only need a little sperm but all eggs are collected
- Collected gametes are tagged or labeled
- Do not self fertilize



Fertilization

- Eggs are collected in a separate container.
- Sperm from at least 3 clams is added.
- Do not add too much sperm or a condition called “polyspermy” occurs.
- Only add about 1-5 ml per liter of eggs.



Types of Larval Rearing

- Intensive – high survival, high input
- Semi-intensive – better survival, lower input
- Extensive – lower survival, low input

Intensive larval rearing

- Larvae are held in covered tanks at a density of 10-20 per ml.
- Tanks are drained down every 2 days until the larvae have metamorphosed.
- Antibiotics can be used to increase survival
- Feeding can take place
- Need a small hatchery or covered tanks
- Need more equipment

Semi-intensive larval rearing

- Larvae are kept in intensive conditions only through the critical first 2 days.
- This improves survival and can save time because larvae are most likely to die in the first 2 days.
- Larvae are then transferred to a large tank
- Still requires more equipment and tanks



Extensive Larval Rearing

- Eggs are stocked at 1/ml into a large tank such as a raceway.
- The raceway is left without aeration and water flow for 10 days or until larvae set.
- The tank is usually outdoors and can be covered to prevent dilution in heavy rains.

Zooxanthelle

- These are the algae that form a symbiotic relationship with the clams.
- They do not occur in clam larvae and have to be added to the tank. This is done 4-5 days after spawning.
- Method 1. Clam mantle is minced and zoots are extracted.
- Method 2. Put clams in the tank.