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.”
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.
Zooxanthellae

• 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.