

## Performance Progress Report - NA10NMF4270214

Title: **Enhancing Sea Scallop Stocks in Eastern Maine through Applied Aquaculture  
Research and Technology Transfer**

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### **Broodstock**

Scallop broodstock were conditioned at DEI continuously during this time period. The broodstock scallops were kept in a temperature-controlled room at 11-12°C in 1,400L tanks. These tanks were drained every other day and cleaned with a soap and bleach solution. Saltwater placed in tanks at drain-downs was filtered to 1 micron, but was not UV sterilized. Animals were fed daily a mixed microalgal diet (*Chaetoceros* spp, *Skeletonema* sp., *Thalassiosira* spp., *Rhodomonas* sp., *Isochrysis* sp., *Tetraselmis* sp.) *ad libitum* (15-30 liters per day). At times, dead individuals were removed and replaced as they disrupted feeding for the other animals. We experienced several spawning events and several larval batches were generated from those spawn events. One of the problems we encountered was spontaneous spawning; once these animals were conditioned, any minute disturbance would prompt them to spawn.

### **Larvae**

We attempted a simple experiment to determine why past trials resulted in no commercial-scale production of sea scallop spat. That is, to discern why larvae do not survive well beyond Day 20-25. We used algal tubes (Kelwall, or K-tubes; volume = 90 L) for the experimental trial and used 4 treatments: 1) bleach-treated seawater (bleach water followed the next day by neutralizing the beach with sodium thiosulfate); 2) triple sulfa treated seawater (antibiotic), 3) UV-treated seawater and 4) untreated seawater (control). Each treatment was replicated twice. Two blocks were established: each block had 4 treatments and 2 replicates each. Each K-tube was "seeded" with approximately 400,000 larvae for a

density of five animals per milliliter. All larvae for this trial were scooped from the spawning tank and not drained from the bottom of the tank on a sieve. The tubes were drained every other day, cleaned with a soap and bleach solution, and rinsed thoroughly. Scallops were fed a mixed microalgal diet (200 ml per day). Larval counts were completed every other drain-down. The experiment ended after 22 days as the numbers of larvae in all treatments declined dramatically. The conclusion that we reached was that the K-tubes were not appropriate for scallop larval rearing. That is, we could discern no significant effects due to the seawater treatments.

Concurrent with the trial above, we conducted another trial using larvae (10 million initially) from the same spawning, and these were reared in a flat bottom tank (1,400L) using untreated seawater. This system performed better than the K-tube experiment. Unfortunately, numbers declined steadily and, after 35 days, we ended up setting only a handful of larvae on spat bags with Netron (a plastic mesh with ¼-inch aperture) included in each. After 83 days we placed the spat bags into our flow-through container (ambient water); however, at the end of May 2013, no juveniles were observed on/in these bags.

During May, we had two spawning events. One on May 15 and the other on May 25. The first batch was split and set up in two conical tanks (400 L) at 14° C and these larvae were fed a mixed algal diet (1.75 L of food). Each tank received 1.5 million larvae. The water was left untreated. Larvae were scooped initially and then siphoned out of the spawning tank. Currently, we have observed minimal loss in these tanks and are setting these larvae on different types of rope (designed for mussel spat). The second batch (May 25) was scooped and siphoned out of the spawning tank (10 million) and set up in a flat bottom tank (1,400 L) at 11-12° C. The tank was drained every other day and was fed a mixed larval diet (5 L of food). Larvae performed very well until we had a mechanical failure with the air conditioning unit cooling the room that the tank was in, which resulted in temperatures of 15-16° C. The unit was repaired within two days of the failure; however, we started noticing a steady decline in numbers. Currently, there are very few larvae remaining and we are unsure if we will have anything to set from this batch.

We continue to condition broodstock and are still trying a variety of methods to rear sea scallop larvae that will, hopefully, survive through metamorphosis. There are so many variables that we have tried to evaluate, and to date, none have resulted in a commercial production of sea scallop spat. We look forward to continuing the trials and examining alternative methods to what we have attempted to date.