Moonsnails at the Haul Up

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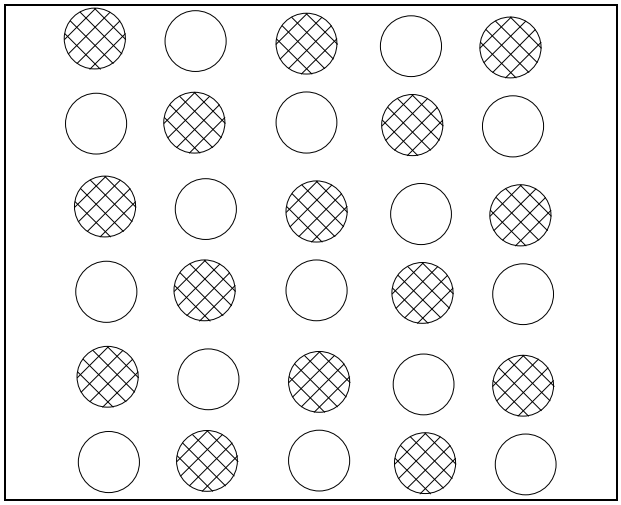
On Friday, May 30, 2008 a field experiment was initiated at the lower and upper tidal levels at the Haul Up, in Lubec. The experiment was designed to test the survival and growth of soft-shell clam seed from the Downeast Institute in protected (netting) and unprotected (open) 6-inch plastic plant pots at each of the two tidal levels.

Clams used in the trial ranged in size from 8.8 to 14.4 mm (or from about 3/8^{ths} of an inch to a bit over a ½-inch) with an average size of 11.3 mm (4/10th of an inch). Thirty (30) six-inch plastic plant pots were pushed into the mud at each tidal height, filled with mud from the surrounding flat, seeded with twelve (12) hatchery clams, and then a piece of ¼-inch plastic netting was placed over fifteen (15) of the pots. The pots were arrayed in a 6 x 5 matrix as shown below. The netting was the same type of netting used in the clam farm project at Johnson's Bay.



On Saturday, November 8, 2008 the experiment was terminated. All pots were removed from the mud at both tidal heights and then taken to the University of Maine at Machias where each was washed through a sieve with a 2 mm aperture. The number of all live and dead clams was recorded. Growth of all live clams was estimated using Vernier calipers by subtracting initial size on May 30th from final size on November 8th.

Table 1 shows for each tidal height the percent of clams found alive, dead with undamaged shells, and dead with a countersunk bore hole caused by moonsnails in both protected and unprotected pots.

Table 1. Percent of live (A), dead undamaged (DU), dead drilled (DD), and missing (M) clams at each tidal height (low vs. high) at the Haul Up on November 8th 2008. Twelve hatchery-reared clams were seeded into each pot on May 30th 2008. + = Netted pots, - = Open pots without netting. (There were 15 replicates of each netted or open treatments used at each tidal height.)

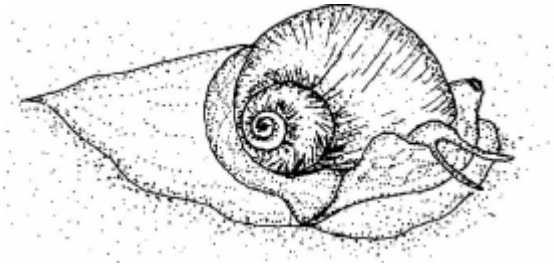
Tidal Height	Netting	%A	%DU	%DD	%M
LOWER	-	0.0	12.8	77.8	9.4
LOWER	+	0.1	10.6	76.1	13.2
UPPER	-	0.1	13.9	71.1	14.9
UPPER	+	3.3	9.4	77.2	10.1

Moon snails accounted for *at least* 70% of the mortality that occurred between May and November at this site. There was no difference in mortality due to snails between tidal heights, and netting afforded clams no protection from snails which apparently were able to crawl through the small (1/4-inch) holes in the mesh netting.

Live moon snails were discovered in pots at each tidal height and in both protected and open pots. At the low tide, an average of 0.5 snails was found in the protected pots and 1.1

snails in the open pots. At the high tide, an average of 0.5 snails was found in the protected pots and 3.0 snails in the open pots.

Snails leave a countersunk hole in their soft-shell clam victims by drilling through the shell with their radula, an internal tooth-like structure that enables moonsnails to drill through the shells of their clam victims. The scraping action of the radula is accompanied by an acidic enzyme that dissolves the calcium of the shell at the same time. The end result is a perfectly round bore hole that is narrower on the bottom than the top (hence, the reference to a countersunk bore hole).



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