Density, growth, and reproduction of the cockle *Laevicardium mortoni* in the Peconic Bays, Long Island, New York

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### Introduction

*Mortoni*’s egg cockle, *Laevicardium mortoni*, is common in shallow subtidal habitats from Nova Scotia to Brazil, but little is known of its biology and ecology (Loosanoff et al, 1966). Belonging to the family Cardiidae, these cockles are functional hermaphrodites and reach a maximum size of 25 mm (Loosanoff & Davis, 1963). The first metamorphosing individuals have been previously seen at 8-10 days after fertilization (Loosanoff & Davis, 1963). This study investigated age and size at first reproduction, growth rates and temporal patterns of reproduction, and whether density of *L. mortoni* varied with location, depth, sediment type, and date.

### Materials and Methods

- **Condition Indexes**: For a range of cockle sizes (>7, >7mm) were quantified weekly at two sites, Little Bay and Peter’s Neck, to estimate age and size at first reproduction.
- **Growth Rates & Temporal Patterns**: Reproduction was determined via condition indexes, weekly core samples, analysis of indexes for a range of cockle sizes, as well as by monitoring larval settlement in spat bags placed at 25 locations in the Peconic Bays. Sput bags were collected every 6 weeks.
- **Density & Site Variability**: Density vs. Depth Peter’s Neck and Little Bay from 5/27/16 to 10/6/16. Animals ≥1 yr cohorts that recruited by adults that have successfully overwintered as well as by multiple 0+ yr cohorts that recruited during the late spring to late summer.

### Results

- **Temperature vs. Condition Index**: At Peter’s Neck and Little Bay, New York, from 5/27/16 to 10/6/16. Temperature is shown in purple, condition index in red. Spawning peaks are shown to correlate with temperature increases.

### Conclusions

*L. mortoni* exhibited multiple (perhaps 5) spawns and recruitment peaks in eastern Long Island, New York, embayments between late May – September 2016. Reproductive development was very rapid: eggs were observed in all individuals at shell lengths ≥7 mm. The largest individuals found in spat collectors (which had been deployed for 6 weeks) were 11 mm; thus, maximum growth rates were nearly 2 mm/week. Since reproductive maturity may be reached by 7 mm, minimum age at first reproduction can be inferred to occur at an age of approximately 4 weeks. While the longevity of *L. mortoni* has not yet been determined, it is likely that spawning in New York populations is accomplished by adults that have successfully overwintered as well as by multiple 0+ yr cohorts that recruited during the late spring to late summer.

Densities of *L. mortoni* quantified via suction dredging did not vary significantly by site or sample period; however, despite multiple recruitment pulses, densities did vary significantly with depth and the proportion of gravel present in surficial sediments. No cockles were found in the intertidal zone or at depths >3.45m; these patterns confirm those reported in the literature.

### Literature Cited


Divers suction dredging a 1 m² quadrat in Little Bay, NY. Photo Credit: Steve Tettelbach

*L. mortoni* just prior to digging into the sediment, Peter’s Neck, Orient Harbor, New York. Photo credit: Steve Tettelbach

*L. mortoni* shell being separated from tissue for Condition Indexes.

*L. mortoni* from spat collectors, illustrating the range of color morphs.