

TABLE 1.

Stocking conditions of oysters cultured off-bottom at the two study sites. Densities are given in numbers of oysters (or volume in liters) per culture unit (tray or pearl net). Number of packed oysters per unit volume was determined in triplicate from subsamples; NT = oysters not thinned at this date.

A) Oyster Bay study site (date of deployment = June 14, water temperature = 21 .5°C); H = mean shell height; HD and LD = high and low density experimental groups. Date notation = month/day.				
	Small 1991 Cohort		Large 1991 Cohort	
Initial H (mm)	6.4		16.1	
(SE, n)	(0.12, 50)		(0.30, 50)	
	Stocking densities (#/tray; volume (l)/tray)			
Date	HD	LD	HD	LD
6/14	35,700 (2.4)	3,803 (0.25)	7,200 (6.0)	2,000 (1.7)
6/28	19,680 (6.0)	NT	3,680 (8.0)	NT
7/11	3,360 (4.0)	2,232 (3.6)	NT	2,106 (3.6)
7/26	2,340 (6.0)	1,170 (3.0)	1,540 (8.8)	700 (4.0)
8/9	1,424 (8.0)	572 (4.0)	1,167 (9.0)	465 (4.5)
8/23	996 (12.0)	431 (5.2)	484 (11.0)	264 (6.0)
9/6	576 (12.0)	192 (4.0)	400 (10.0)	111 (3.0)
9/20	370 (10.0)	NT	392 (8.0)	NT
B) Fishers Island study site (date of deployment = June 12, water temperature = 18°C).				
	Small 1991 Cohort		Large 1990 Cohort	
Initial H (mm)	8.9		31.7	
(SE, n)	(0.23, 49)		(0.92, 30)	
Stocking density (#/pearl net)	500		200*	

*Thinned to 100 oysters/pearl net from July 25 onward.

iodine solution, in its concentrated acidic version (Thronsdon 1978), for determination of phytoplankton species composition and cell concentrations. Population densities of phytoplankters greater than 5 µm were determined using a Sedgwick-Rafter chamber. A numerically dominant algal species, *Gymnodinium sartguineum* (Hirasaka) (= *nelsoni* = *splendens*), was counted at 200 x magnification in unconcentrated samples. For other species, cells in water samples were first concentrated by centrifugation, and enumerated at 400X. The 95% confidence interval was estimated according to Venrick (1978).

Qualitative, visual assessments were made on the degree of siltation and fouling of trays, prevalence of pale digestive glands (a gross indicator of feeding inhibition), and mud blisters (presumably caused by the boring polychaete *Polydora* sp.) determined by dissecting 15 oysters from each cohort.

Determination of Mortality and Growth

Percent mortality was determined *in situ* from a representative sample of at least 100 oysters from each replicate, by prying open the valves with a scalpel, and determining the presence/absence of tissues attached to the shell. Live oysters were returned to the laboratory, where any additional deaths undetected in the field sampling were determined following dissection for dry weight and condition index determination. Counts of disarticulated cupped (left) valves were included in mortality estimates.

At each sampling date, 22 to 50 live oysters from each of two replicate groups were measured with digital calipers (*O. 1 mm) to obtain shell height (H). Tissues were dissected and oven-dried to constant weight at 50°C to determine dry weight, using an analytical balance (±0. 1 mg) or Cahn electrobalance (±0.01 mg) as

appropriate. The sample size was increased to 50 oysters per replicate from July 26 onwards, to accommodate increasing variability in size over time. Whole body weight of tightly-closed oysters, air-dried at room temperature, and dry weight of shells was also determined to estimate the condition index. Soft tissue weight and condition index of small oysters were not determined on the first sampling date (June 14), because oysters could not be reliably shucked at this small size. The following gravimetric condition index (CI) was determined:

$$CI = \frac{\text{Dry meat weight (g)}}{\text{X 1000/Internal shell cavity capacity}},$$

where internal shell cavity capacity (g) = (whole live body weight in air) – (dry shell weight in air), following removal of epibionts and debris from the valves (modified from the formula provided by Lawrence and Scott 1982). The gravimetric CI has been recommended as the standard index of choice to measure the nutritive status and meat yield of oysters (Crosby and Gale 1990), and has been ranked as the most sensitive out of 21 indices commonly employed for oysters (Bodoy et al. 1986). The incidence of abnormal conchiolin deposition on the inner shell surface was recorded from July 11 onwards.

Histopathology

Histopathology was performed at the Haskin Shellfish Research Laboratory (HSRL) of Rutgers University, the Battelle Ocean and Marine Sciences Laboratories (Battelle), and the Virginia Institute of Marine Science (VIMS). For light microscopy, a minimum of 25 randomly chosen oysters (including both live and gaping oysters) from each experimental cohort were preserved in