

Spatio-temporal dynamics of ascidian larval recruitment and colony abundance in a non-indigenous Newfoundland population

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Table S1. List of 18 contiguous deployment periods of artificial plates in Arnold’s Cove, Placentia Bay, Newfoundland and Labrador, Canada.

Deployment start date	Deployment end date
March 17, 2010	April 14, 2010
April 14, 2010	May 11, 2010
May 11, 2010	June 7, 2010
June 7, 2010	July 5, 2010
July 5, 2010	August 5, 2010
August 5, 2010	September 2, 2010
September 2, 2010	October 1, 2010
September 14, 2010	October 12, 2010
October 1, 2010	October 26, 2010
October 12, 2010	November 9, 2010
November 9, 2010	December 8, 2010
December 8, 2010	January 12, 2011
January 12, 2011	March 30, 2011
March 30, 2011	June 15, 2011
June 15, 2011	August 1, 2011
August 1, 2011	August 30, 2011
August 30, 2011	September 28, 2011
September 28, 2011	November 15, 2011

Table S2. Nested analysis of variance (ANOVA; generalised linear model) of $\ln(x+1)$ transformed daily mean seawater temperature, salinity, chlorophyll *a* concentration, and turbidity ($n = 601$ per environmental variable) that were recorded at 1 m depth from March 2010 to November 2011. *** = significant at $p < 0.001$; ** = at $p < 0.01$; * = at $p < 0.05$.

Source of variation	Temperature		Salinity		Chlorophyll <i>a</i>		Turbidity	
	Wald χ^2	df	Wald χ^2	df	Wald χ^2	df	Wald χ^2	df
(Intercept)	4.4×10^4 ***	1	2.1×10^7 ***	1	2.3×10^3 ***	1	7.0×10^2 ***	1
Year	1.4×10^2 ***	1	9.7×10^0 *	1	8.7×10^1 ***	1	1.8×10^1 ***	1
Month (Year)	5.9×10^3 ***	19	4.6×10^2 ***	19	5.2×10^2 ***	19	6.3×10^2 ***	19

Table S3. Analysis of variance (ANOVA; generalised linear model) of $\ln(x+1)$ transformed daily mean seawater temperature and salinity recorded every 1 m interval from the water surface to 5 m depth from March 2010 to June 2011 in Arnold's Cove, Placentia Bay, Newfoundland and Labrador, Canada. *** = significant at $p < 0.001$; ** = at $p < 0.01$; * = at $p < 0.05$; NS = not significant.

Source of variation	Temperature		Salinity	
	Wald χ^2	df	Wald χ^2	df
(Intercept)	$5.9 \times 10^{4***}$	1	$1.7 \times 10^7***$	1
Month	$8.2 \times 10^3***$	12	$6.6 \times 10^2***$	12
Site	NS	2	NS	2
Depth	$2.1 \times 10^{1**}$	5	$2.1 \times 10^{1**}$	5
Month \times Site	NS	16	NS	16
Month \times Depth	NS	60	NS	60
Site \times Depth	NS	10	NS	10
Month \times Site \times Depth	NS	79	NS	79

Table S4. Analysis of variance (ANOVA) of the two-component conditional model of daily recruitment rates of *Botryllus schlosseri* from the 2010 sampling season (analysis #1, see Methods). All main and interaction effects were not significant for the first component (not shown), which consisted of presence and absence data. The second component consisted of zero-truncated data, which were natural logarithm transformed. *** = significant at $p < 0.001$; ** = at $p < 0.01$; * = at $p < 0.05$; NS = not significant.

Source of variation	Wald χ^2	df
(Intercept)	$1.8 \times 10^{1***}$	1
Time	$3.3 \times 10^{1***}$	4
Site	NS	2
Depth	$1.0 \times 10^{1**}$	2
Substrate	$2.6 \times 10^{1***}$	2
Time \times Site	$2.9 \times 10^{1***}$	8
Time \times Depth	$1.8 \times 10^{1**}$	6
Time \times Substrate	$2.8 \times 10^{1***}$	5
Site \times Depth	NS	4
Site \times Substrate	NS	4
Depth \times Substrate	NS	4

Table S5. Nested analysis of variance (ANOVA) of the two-component conditional model of daily recruitment rates of *Botryllus schlosseri* on PVC from the 2010 and 2011 sampling seasons (analysis #2, see Methods). All main and interaction effects were not significant for the first component (not shown), which consisted of presence and absence data. The second component consisted of zero-truncated data, which were natural logarithm transformed. *** = significant at $p < 0.001$; ** = at $p < 0.01$; * = at $p < 0.05$; NS = not significant.

Source of variation	Wald χ^2	df
(Intercept)	$8.3 \times 10^{1***}$	1
Year	NS	1
Month (Year)	$8.8 \times 10^{1***}$	6
Site	NS	2
Depth	$2.2 \times 10^{1***}$	2
Year \times Site	NS	2
Year \times Depth	$7.1 \times 10^{0*}$	2
Month (Year) \times Site	$3.1 \times 10^{1**}$	11
Month (Year) \times Depth	$3.2 \times 10^{1***}$	9
Site \times Depth	NS	4

Table S6. Partitioned analyses of variance (ANOVAs) of the second component model of daily recruitment rates of *Botryllus schlosseri* from the 2010 sampling season (analysis #1). The second component consisted of zero-truncated data, which were natural logarithm transformed. *** = significant at $p < 0.001$; ** = at $p < 0.01$; * = at $p < 0.05$; NS = not significant.

Partitioned ANOVA	Source of variation	Wald χ^2	df
Depth of 1.0 m	(Intercept)	$4.8 \times 10^{1***}$	1
	Time	$1.7 \times 10^{1**}$	4
Depth of 2.5 m	(Intercept)	$1.6 \times 10^{2***}$	1
	Time	NS	3
Depth of 4.0 m	(Intercept)	$7.1 \times 10^{1***}$	1
	Time	NS	3
Site #1	(Intercept)	$1.9 \times 10^{1***}$	1
	Time	NS	4
Site #2	(Intercept)	$1.5 \times 10^{1***}$	1
	Time	NS	4
Site #3	(Intercept)	$5.3 \times 10^{1***}$	1
	Time	NS	4
Aluminum substrate	(Intercept)	$7.7 \times 10^{0**}$	1
	Time	$7.7 \times 10^{0*}$	2
PVC substrate	(Intercept)	$1.7 \times 10^{2***}$	1
	Time	$4.4 \times 10^{1***}$	4
Wood substrate	(Intercept)	NS	1
	Time	NS	3

Table S7. Partitioned analyses of variance (ANOVAs) of the second component model of daily recruitment rates of *Botryllus schlosseri* on PVC from the 2010 and 2011 sampling seasons (analysis #2). The second component consisted of zero-truncated data, which were natural logarithm transformed. *** = significant at $p < 0.001$; ** = at $p < 0.01$; * = at $p < 0.05$; NS = not significant.

Partitioned ANOVA	Source of variation	Wald χ^2	df
Depth of 1.0 m	(Intercept)	$8.5 \times 10^{1***}$	1
	Year	NS	1
	Month (Year)	$2.5 \times 10^{1***}$	6
Depth of 2.5 m	(Intercept)	$4.8 \times 10^{1***}$	1
	Year	4.533*	1
	Month (Year)	$2.2 \times 10^{1**}$	5
Depth of 4.0 m	(Intercept)	$4.0 \times 10^{1***}$	1
	Year	6.841**	1
	Month (Year)	$7.4 \times 10^{1***}$	5
Site #1	(Intercept)	$2.0 \times 10^{1***}$	1
	Year	NS	1
	Month (Year)	$2.7 \times 10^{1***}$	6
Site #2	(Intercept)	$4.4 \times 10^{1***}$	1
	Year	NS	1
	Month (Year)	$4.0 \times 10^{1***}$	6
Site #3	(Intercept)	$1.2 \times 10^{1**}$	1
	Year	NS	1
	Month (Year)	$1.7 \times 10^{1**}$	6

Table S8. Analyses of variance (ANOVAs) of the two-component conditional model of density and percent cover of colonies of *Botryllus schlosseri* on wharf pilings from March 2010 to May 2011. The first component consisted of presence and absence data. The second component consisted of zero-truncated data, which were natural logarithm transformed. All main and interaction effects were not significant for the second component (not shown). *** = significant at $p < 0.001$; ** = at $p < 0.01$; * = at $p < 0.05$; NS = not significant.

Source of variation	Wald χ^2	df
(Intercept)	NS	1
Time	$3.2 \times 10^{1***}$	9
Zone	$6.8 \times 10^0*$	2
Time \times Zone	NS	18