The following supplement accompanies the article

Movement patterns drive within-mudflat distribution of an intertidal amphipod

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Marine Ecology Progress Series 431:255–265 (2011)

Supplement. *Corophium volutator*. Variance component analysis of within-mudflat variation in density, demographic and movement variables

Table S1. ANOVA model used to evaluate the degree of spatial structuring of the adjusted residuals of density and of the different demographic and movement variables. The factors Time, Transect and Distance zone were random. The *F*-ratio for the main effects could not be estimated, so we used quasi-*F*-ratios (Underwood 1997). We used variance components analysis (Underwood 1997) to estimate the proportion of the variation that was explained by the different sources of variation. *a*, *b*, *c* and *n* represent number of sampling dates, number of transects, number of distance zones and harmonic mean number of samples per location–time combination, respectively. For the variance component of a particular source of variation, 'Num.' and 'Denom.' refer to the numerator MS (mean square) and the denominator MS of the *F*- or quasi-*F*-ratio

Source of variation	*F* or quasi *F*-ratio	Variance component
Time T_i	$\frac{MS_T + MS_{TRD}}{MS_{TR} + MS_{TD}}$	$\frac{\text{Num.–Denom.}}{bcn}$
Transect R_j	$\frac{MS_R + MS_{TRD}}{MS_{TR} + MS_{RD}}$	$\frac{\text{Num.–Denom.}}{acn}$
Distance zone D_k	$\frac{MS_D + MS_{TRD}}{MS_{TD} + MS_{RD}}$	$\frac{\text{Num.–Denom.}}{abn}$
Time x Transect TR_{ij}	$\frac{MS_{TR}}{MS_{TRD}}$	$\frac{\text{Num.–Denom.}}{cn}$
Time x Distance TD_{ik}	$\frac{MS_{TD}}{MS_{TRD}}$	$\frac{\text{Num.–Denom.}}{bn}$
Transect x Distance RD_{jk}	$\frac{MS_{RD}}{MS_{TRD}}$	$\frac{\text{Num.–Denom.}}{an}$
Time x Transect x Distance TRD_{ijk}	$\frac{MS_{TRD}}{MS_{Res}}$	$\frac{\text{Num.–Denom.}}{n}$
Residual *Res*		MS_{Res}

Table S2. *Corophium volutator*. Results of random-model ANOVAs (see Table S1) for (1) density in the mud (square-root transformed), (2) proportion of individuals that were adults, (3) proportion of adults that were females, (4) proportion of females that were ovigerous, (5) proportion of marked individuals that were recaptured, (6) density of immigrants [$\log_{10}$(datum + 1)-transformed] and (7) density of swimmers (square-root-transformed) of *C. volutator* on the mudflat of Pecks Cove between May 2006 and July 2007. The response variables are adjusted residuals to remove seasonal effects (see 'Materials and methods, Data analysis'). The log and square-root transformations were done to meet the assumption of homogeneity of variance. Degrees of freedom for the quasi-*F*-ratios were calculated as in Underwood (1997). Some sampling dates were not included in the analysis because of low sample size. For example, many samples in the fall had no adults, and so the proportion of adults what were females and proportion of females that were ovigerous could not be calculated

Dependant variable	Source of variation	df	MS	*F*	df for quasi-*F*-ratio		p	Variance component	Percent of variation
					Num.	Denom.			
Density	Time	12	0.00	0.11	3.79	40.52	0.95	0.00	0.00
	Transect	6	2.41	1.63	3.79	31.27	0.20	5.50E-3	2.00
	Distance	2	25.13	7.22	21.38	64.84	<0.001	4.92E-2	17.95
	Time _ Transect	72	0.33	1.15			0.14	3.00E-3	1.09
	Time _ Distance	24	2.20	7.63			<0.001	5.60E-2	20.39
	Transect _ Distance	12	1.32	4.58			<0.001	1.62E-2	5.92
	Time _ Transect _ Distance	144	0.29	2.67			<0.001	3.71E-2	13.52
	Residual	1067	0.11					1.07E-1	39.13
Proportion of adults	Time	11	0.09	0.25	82.91	196.5	1.00	0.00	0.00
	Transect	6	1.99	1.02	82.91	49.44	0.44	0.00	0.00
	Distance	2	1.46	0.76	1.00	135.3	0.86	0.00	0.00
	Time _ Transect	66	2.16	2.05			<0.001	8.45E-2	10.23
	Time _ Distance	22	2.47	2.34			0.002	4.62E-2	5.60
	Transect _ Distance	12	0.83	0.79			0.66	0.00	0.00
	Time _ Transect _ Distance	132	1.05	1.79			<0.001	1.06E-1	12.82
	Residual	969	0.58					5.89E-1	71.35
Proportion of females	Time	8	0.00	0.37	3.96	9.12	0.78	0.00	0.00
	Transect	6	0.18	1.35	3.96	6.83	0.34	6.10E-4	0.61
	Distance	2	0.51	2.69	1.12	2.88	0.24	1.4E-3	1.39
	Time _ Transect	48	0.14	1.31			0.13	2.51E-3	2.50
	Time _ Distance	16	0.16	1.51			0.11	1.74E-3	1.74
	Transect _ Distance	12	0.07	0.67			0.78	0.00	0.00
	Time _ Transect _ Distance	96	0.10	1.15			0.17	3.13E-3	3.12
	Residual	709	0.09					9.1E-2	90.64

Proportion of ovigerous females	Time	5	0.02	0.21	14.25	26.61	0.99	0.00	0.00
	Transect	6	0.84	1.41	14.25	30.57	0.21	7.68E-3	0.78
	Distance	2	13.48	2.52	15.48	24.54	0.02	5.06E-2	5.14
	Time _ Transect	30	0.52	0.46			0.99	0.00	0.00
	Time _ Distance	10	4.92	4.40			<0.001	1.31E-1	13.33
	Transect _ Distance	12	0.87	0.78			0.67	0.00	0.00
	Time _ Transect _ Distance	60	1.12	1.61			0.004	1.03E-1	10.44
	Residual	447	0.69					6.92E-1	70.32
Proportion recaptured	Time	7	0.00	0.15	1.00	40.04	0.70	0.00	0.00
	Transect	2	6.00	1.02	1.00	39.70	0.32	9.58E-4	0.12
	Distance	2	6.49	5.06	5.79	13.94	0.009	4.48E-2	5.78
	Time _ Transect	14	6.22	6.06			<0.001	3.09E-1	39.86
	Time _ Distance	14	0.81	0.79			0.67	0.00	0.00
	Transect _ Distance	4	0.68	0.66			0.63	0.00	0.00
	Time _ Transect _ Distance	28	1.03	3.55			<0.001	1.32E-1	16.98
	Residual	335	0.29					2.89E-1	37.26
Density of immigrants	Time	9	0.00	0.32	1.00	7.00	0.59	0.00	0.00
	Transect	2	0.16	0.53	1.00	6.48	0.49	0.00	0.00
	Distance	2	1.14	1.14	1.68	3.44	0.36	3.50E-4	0.64
	Time _ Transect	18	2.14	2.14			0.03	9.78E-3	17.97
	Time _ Distance	18	1.01	1.01			0.47	1.28E-4	0.24
	Transect _ Distance	4	1.85	1.85			0.14	2.20E-3	4.04
	Time _ Transect _ Distance	36	0.14	7.01			<0.001	2.21E-2	40.56
	Residual	410	0.02					1.99E-2	36.56
Density of swimmers	Time	8	0.00	0.22	1.00	11.84	0.65	0.00	0.00
	Transect	2	1.98	4.08	1.00	4.97	0.11	1.26E-2	4.91
	Distance	2	8.07	7.29	2.70	12.39	0.008	5.43E-2	21.08
	Time _ Transect	16	0.24	1.03			0.46	4.01E-4	0.16
	Time _ Distance	16	0.83	3.60			0.0001	4.11E-2	15.96
	Transect _ Distance	4	0.31	1.32			0.28	1.67E-3	0.65
	Time _ Transect _ Distance	32	0.23	1.84			0.008	2.17E-2	8.41
	Residual	159	0.13					1.26E-1	48.82

LITERATURE CITED

Underwood AJ (1997) Experiments in ecology: their logical design and interpretation using analysis of variance. Cambridge University Press, Cambridge