

SUPPLEMENTARY MATERIAL:

Text S1. Calculation of immersion and emersion periods of CTDs and MOHID data

The times at which each CTD logger was immersed with the flowing tide was annotated on 19 and 20 April 2022 at Combarro (14:05) and Noia (14:11), respectively. The tidal heights correspondent to the annotated times at the field were interpolated from the hourly heights provided by the MOHID model to obtain the immersion water level (m) of CTDs (Noia: -0.6583, Combarro: -0.1598). Temperature and salinity measurements were then paired by time steps with MOHID water level height time series at both sites. The immersion water levels obtained were applied as thresholds to subset emersion and immersion temperatures and salinity from CTD's and MOHID data.

Table S1. Summary of monthly data of environmental variables recorded at the study sites between 1/6/2015 and 31/12/2020, at the closest meteorological stations (source: https://www.meteogalicia.gal/observacion/estaciones/estaciones.action?request_locale=gl)

Site	Mean temperature at 1.5 m (°C)	Maximum temperature at 1.5 m (°C)	Relative humidity at 1.5 m (%)	Days of rain	Pluviometry (L m ⁻²)	Meteorological station (coordinates)
Noia	14.4 ± 3.8	26.1 ± 6.4	75.6 ± 5.9	13.6 ± 6.7	158 ± 128	Lesende (42.80141° N, 8.836885° W)
Combarro	15.8 ± 4.3	29.1 ± 5.9	76.4 ± 6.8	12.2 ± 6.3	135 ± 117	Campolongo (42.425896° N, -8.643984° W)

Table S2. Regression models between the true number of dead clams (Y) versus the visible ones (X), constructed with data from the simultaneous salinity stress experiment.

Species	Model	df	R ²	p
<i>Venerupis corrugata</i>	True = 1.035 (±0.3) + 1.853 (±0.3) Visible	78	0.345	<0.001
<i>Ruditapes decussatus</i>	True = 0.619 (±0.1) + 1.274 (±0.1) Visible	78	0.565	<0.001
<i>Ruditapes philippinarum</i>	True = 0.067 (±0.03) + 1.099 (±0.1) Visible	78	0.465	<0.001

Table S3. Median and Robust SD of the true number of dead clams in the baskets, predicted per each combination of treatments, estimated from the visible dead clams with the regressions models of Table S1.

Species	Habitat	Salinity	Mean Visible	Median Predicted True	Robust SD
<i>Venerupis corrugata</i>	Sediment	35	0	1	0
		10	0	1	0
		5	1	3	2
	<i>Zostera noltei</i>	35	0	1	0
		10	0	1	0
		5	0	1	2
<i>Ruditapes decussatus</i>	Sediment	35	1	2	1
		10	1	1	1
		5	1	2	1
	<i>Zostera noltei</i>	35	1	2	1
		10	0	1	0
		5	1	1	1
<i>Ruditapes philippinarum</i>	Sediment	35	0	0	0
		10	0	0	0
		5	1	1	1
	<i>Zostera noltei</i>	35	0	0	0
		10	0	0	0
		5	0	0	0

Table S4. Comparison of AICc between models with random factor basket (full models) and without it (fixed models). Chosen models are in bold.

a) <i>Zostera noltei</i>				
Response variable			AICc Full model	AICc Fixed model
Initial leaf length			12396.4	13384.1
Final leaf length			10200.19	10446.65
C % in leaves			1488.561	1548.805
N % in leaves			-37.894	89.467
b) Clams				
Response variable	Species	Site	AICc Full model	AICc Fixed model
Survival	<i>Venerupis corrugata</i>	Noia	241.153	244.538
		Combarro	259.495	261.170
	<i>Ruditapes decussatus</i>	Noia	327.345	339.774
		Combarro	351.466	382.092
	<i>Ruditapes philippinarum</i>	Noia	402.687	415.527
		Combarro	370.935	380.095
Shell growth	<i>Venerupis corrugata</i>	Noia	402.474	410.908
		Combarro	273.277	289.953
	<i>Ruditapes decussatus</i>	Noia	645.629	648.496
		Combarro	470.246	479.716
	<i>Ruditapes philippinarum</i>	Noia	774.269	782.001
		Combarro	801.231	963.162
Flesh increment	<i>Venerupis corrugata</i>	Noia	-1056.62	-1053.92
		Combarro	-1048.797	-1042.518
	<i>Ruditapes decussatus</i>	Noia	-1075.095	-1075.733
		Combarro	-928.335	-930.516
	<i>Ruditapes philippinarum</i>	Noia	-1051.36	-1053.396
		Combarro	-1493.897	-1466.05
Condition index	<i>Venerupis corrugata</i>	Noia	2219.836	2338.678
		Combarro	1860.963	1867.698
	<i>Ruditapes decussatus</i>	Noia	2135.971	2164.374
		Combarro	1493.831	1516.966
	<i>Ruditapes philippinarum</i>	Noia	2639.980	2678.819
		Combarro	2617.671	2658.491

Table S5. List of models for the responses of *Zostera noltei* to site, habitat and salinity factors assessed in the selection approach of the fixed structure. For simplification, only those with a $\Delta\text{AICc} < 4$ are included (Barton, 2022). Factors are: 0 = none, 1 = Site; 2 = Past salinity; 3 = Habitat. Nested options are: F=False, T=True. Final models are in bold.

Response variable	Factors	df	logLik	AICc	ΔAICc	Weight	Nested
Initial length	0	8	-6193.550	12403.2	0.00	0.562	F
	3	9	-6193.210	12404.5	1.35	0.287	T
	2	10	-6193.246	12406.6	3.45	0.100	T
Final length	1+2+3+1:3	13	-5104.006	10234.3	0.00	0.466	F
	1+2	12	-5106.951	10236.1	1.80	0.190	F
	1+2+3	11	-5106.126	10236.5	2.19	0.156	T
	1+2+3+2:3+1:3	15	-5103.392	10237.2	2.88	0.110	T
	1+2+3+1:2+1:3	15	-5103.743	10237.9	3.58	0.078	T
Above ground biomass	1+3	4	-82.702	174.0	0.00	0.595	F
	3	3	-84.829	176.0	2.00	0.219	F
	1+3+1:3	5	-82.702	176.3	2.32	0.186	T
Below ground biomass	1	3	-62.488	131.3	0.00	0.306	F
	1+3	4	-61.381	131.4	0.04	0.300	T
	1+3+1:3	5	-61.171	133.3	1.94	0.116	F
	1+2	5	-61.548	134.0	2.69	0.080	F
	1+2+3	6	-60.454	134.2	2.90	0.072	F
	0	2	-65.129	134.4	3.10	0.065	T
	3	3	-64.104	134.6	3.23	0.061	F
	Carbon in leaves	0	3	-733.847	1473.7	0.00	0.228
1	4	-732.966	1474.0	0.27	0.199	T	
3	4	-733.417	1474.9	1.18	0.127	T	
1+3	5	-732.537	1475.2	1.46	0.110	T	
2	5	-732.955	1476.0	2.30	0.072	T	
1+2	6	-731.949	1476.1	2.34	0.071	T	
1+3+1:3	6	-732.080	1476.3	2.60	0.062	T	
1+2+1:2	8	-730.183	1476.7	2.94	0.052	T	
2+3	6	-732.508	1477.2	3.46	0.040	T	
1+2+3	7	-731.502	1477.3	3.51	0.039	T	

Table S5. (continued)

Response variable	Predictors	df	logLik	AICc	ΔAICc	Weight	Nested
Nitrogen in leaves	2+3+2:3	9	52.607	-86.8	0.00	0.330	F
	1+2	5	48.366	-86.6	0.21	0.396	F
	1+2+3+1:3+2:3	10	52.725	-85.0	1.85	0.131	T
	1+3+1:3	6	48.453	-84.7	2.09	0.116	T
	1+2+3	7	48.912	-83.6	3.24	0.065	T
	1+2+3+1:2+2:3	11	53.023	-83.5	3.35	0.062	T
Sucrose in apical rhizomes	1	3	-256.614	519.6	0.00	0.241	F
	0	2	-257.845	519.9	0.26	0.211	F
	1+3	4	-256.292	521.3	1.63	0.106	T
	2	3	-257.476	521.3	1.72	0.102	T
	1+3+1:3	5	-255.251	521.5	1.90	0.093	T
	1+2	5	-255.266	521.5	1.936	0.092	T
	2	4	-256.586	521.8	2.22	0.079	T
	1+2+3	6	-254.906	523.3	3.64	0.039	T
	2+3	5	-256.176	523.4	3.75	0.037	T
Starch in apical rhizomes	1+3+1:3	5	250.638	512.3	0.00	0.386	F
	1+3	4	252.049	512.8	0.48	0.304	F
	1+2+3+1:3	7	249.100	514.1	1.85	0.153	T
	1+2+3	6	250.743	514.9	2.63	0.103	T
	1+2+3+1:3+2:3	9	247.504	516.2	3.94	0.054	T

Table S6. Survival. List of models for the responses of *Venerupis corrugata*, *Ruditapes decussatus* and *Ruditapes philippinarum* to habitat and salinity factors assessed in the selection approach. For simplification, only those with a $\Delta\text{AICc} < 4$ are included (Barton, 2022). Factors are: 0 = none, 2 = Past salinity; 3 = Habitat. Nested options are: F=False, T=True. Final models are in bold.

Species	Site	Factors	df	logLik	AICc	ΔAICc	Weight	Nested
<i>Venerupis corrugata</i>	Noia	2+3+2:3	7	-113.383	241.2	0	1	F
	Combarro	2	3	-125.181	256.5	0	0.445	F
		0	2	-126.918	257.9	1.42	0.219	F
		2+3	4	-125.181	258.6	2.08	0.158	T
		2+3+2:3	5	-124.600	259.5	3.02	0.099	T
	3	3	-126.908	259.9	3.45	0.079	T	
<i>Ruditapes decussatus</i>	Noia	0	2	-159.936	323.9	0	0.368	F
		2	4	-158.237	324.6	0.71	0.258	T
		3	3	-159.681	325.5	1.54	0.171	T
		2+3	5	-157.836	325.9	1.99	0.136	T
		2+3+2:3	7	-156.448	327.3	3.43	0.066	T
	Combarro	2+3+2:3	7	-168.544	351.5	0	0.399	F
		2+3	5	-170.914	352.0	0.56	0.301	F
	2	4	-171.955	352.0	0.58	0.299	F	
<i>Ruditapes philippinarum</i>	Noia	2+3+2:3	7	-194.193	402.7	0	0.354	F
		0	2	-199.426	402.9	0.20	0.321	F
		2	4	-198.168	404.4	1.76	0.147	T
		3	3	-199.372	404.8	2.12	0.123	T
		2+3	5	-198.108	406.4	3.69	0.056	T
	Combarro	0	2	-180.227	364.5	0	0.617	F
		3	3	-180.214	366.5	2.01	0.226	T
	2	4	-179.564	367.2	2.75	0.156	T	

Table S7. Shell growth. List of models for the responses of *Venerupis corrugata*, *Ruditapes decussatus* and *Ruditapes philippinarum* to habitat and salinity factors assessed in the selection approach. For simplification, only those with a $\Delta\text{AICc} < 4$ are included (Barton, 2022). Factors are: 0 = none, 2 = Past salinity; 3 = Habitat. Nested options are: F=False, T=True. Final models are in bold.

Species	Site	Factors	df	logLik	AICc	ΔAICc	Weight	Nested
<i>Venerupis corrugata</i>	Noia	2+3	6	-187.400	387.2	0.00	0.600	F
		2	5	-189.562	389.4	2.20	0.199	F
		3	4	-187.107	390.9	3.72	0.094	F
		2+3+2:3	8	-187.451	391.6	0.00	0.546	T
		2+3	5	-127.749	266.0	3.61	0.081	T
	Combarro	0	3	-128.093	262.4	0.00	0.492	F
		2	4	-127.910	264.1	1.77	0.204	T
		3	4	-127.949	264.2	1.84	0.196	T
		2+3	5	-127.749	266.0	3.61	0.081	T
		2+3+2:3	6	-127.749	268.2	5.81	0.027	T
<i>Ruditapes decussatus</i>	Noia	3	4	-313.390	635.0	0.00	0.567	F
		0	3	-314.967	636.1	1.06	0.333	F
		2+3	6	-312.990	638.5	3.45	0.101	T
	Combarro	0	3	-225.343	456.8	0.00	0.630	F
		3	4	-225.342	458.9	2.10	0.221	T
		2	5	-224.668	459.7	2.88	0.149	T
	<i>Ruditapes philippinarum</i>	Noia	0	3	-3777.472	761.0	0.00	0.627
3			4	-377.308	762.8	1.73	0.263	T
2			5	-377.141	764.5	3.48	0.110	T
Combarro		0	3	-392.593	791.3	0.00	0.637	F
		3	4	-392.506	793.1	1.88	0.249	T
		2	5	-392.254	794.7	3.44	0.114	T

Table S8. Flesh increment. List of models for the responses of *Venerupis corrugata*, *Ruditapes decussatus* and *Ruditapes philippinarum* to habitat and salinity factors assessed in the selection approach. For simplification, only those with a $\Delta\text{AICc} < 4$ are included (Barton, 2022). Factors are: 0 = none, 2 = Past salinity; 3 = Habitat. Nested options are: F=False, T=True. Final models are in bold.

Species	Site	Predictors	df	logLik	AICc	ΔAICc	Weigh	Nested
<i>Venerupis corrugata</i>	Noia	2+3+2:3	8	562.270	-1107.9	0.00	0.812	F
		2	5	557.629	-1105.0	2.93	0.188	F
	Combarro	2	4	548.170	-1088.1	0.00	0.315	F
		2+3+2:3	6	550.059	-1087.7	0.45	0.251	T
		2+3	5	548.645	-1087.0	1.16	0.177	T
		0	3	546.538	-1087.0	1.18	0.174	F
	3	4	546.846	-1085.5	2.65	0.084	T	
<i>Ruditapes decussatus</i>	Noia	2+3+2:3	7	572.711	-1131.0	0.00	0.580	F
	Combarro	2+3+2:3	7	501.421	-986.2	0	1	F
<i>Ruditapes philippinarum</i>	Noia	2	4	556.678	-1105.2	0.00	0.281	F
		2+3+2:3	7	559.679	-1105.0	0.24	0.249	T
		0	2	554.299	-1104.6	0.66	0.202	F
		2+3	5	557.085	-1104.0	1.25	0.150	T
		3	3	554.781	-1103.5	1.74	0.118	T
	Combarro	0	3	779.519	-1553.0	0.00	0.448	F
		3	4	780.262	-1552.4	0.56	0.338	T
		2	5	780.273	-1550.4	2.60	0.122	T
2+3		6	781.035	-1549.8	3.15	0.093	T	

Table S9. Condition index. List of models for the response of *Venerupis corrugata*, *Ruditapes decussatus* and *Ruditapes philippinarum* to habitat and salinity factors assessed in the selection approach. For simplification, only those with a $\Delta\text{AICc} < 4$ are included (Barton, 2022). Factors are: 0 = none, 2 = Past salinity; 3 = Habitat. Nested options are: F=False, T=True. Final models are in bold.

Species	Site	Predictors	df	logLik	AICc	ΔAICc	Weight	Nested
<i>Venerupis corrugata</i>	Noia	0	3	-1123.668	2253.4	0.00	0.572	F
		3	4	-1123.210	2254.6	1.15	0.322	T
		2	5	-1123.282	2256.8	3.38	0.106	T
	Combarro	3	4	-934.607	1877.4	0.00	0.592	F
		2+3	5	-934.606	1879.5	2.10	0.207	T
		0	3	-936.732	1879.6	2.17	0.200	F
<i>Ruditapes decussatus</i>	Noia	2	5	-1075.62	2161.5	0.00	0.483	F
		0	3	-1078.37	2162.8	1.36	0.245	F
		2+3	6	-1075.5	2163.4	1.93	0.184	T
		3	4	-1078.3	2164.9	3.40	0.088	T
	Combarro	0	3	-754.588	1515.3	0.00	0.483	F
		3	4	-754.389	1517.0	1.69	0.208	T
		2	5	-753.391	1517.1	1.80	0.196	T
		2+3	6	-752.882	1518.2	2.91	0.113	T
<i>Ruditapes philippinarum</i>	Noia	3	4	-1329.4	2666.9	0.00	0.6	F
		0	3	-1330.8	2667.8	0.81	0.4	F
		2+3	6	-1328.2	2668.7	1.75	0.164	T
		2	5	-1329.6	2669.4	2.46	0.115	T
		2+3+2:3	8	-1326.9	2670.5	3.53	0.067	T
	Combarro	0	3	-1284.0	2574.2	0.00	0.561	F
		3	4	-1283.5	2575.2	1.00	0.341	T
		2	5	-1283.7	2577.7	3.48	0.098	T

Table S10. Cumulative SUD below 20 and 10 in the seawater during the initial mesocosm treatments (\pm S.D., n=4) and in the two sites of the transplant recovery period. Numbers within brackets indicate the SUD values normalized to temporal period, since the transplant period of exposure was 10 times that of the experimental mesocosm stress period. Cumulative DD above 20 ° C in the sediment of transplant sites.

	DD above 20 ° C		SUD Below 20	SUD Below 10
	3 cm	8 cm		
Treatment 35			0	0
Treatment 10			13.7 \pm 1.0	0.1 \pm 0.2
Treatment 5			35.7 \pm 6.3	6.3 \pm 0.9
Noia	15.7	6.3	37.17 (3.7)	8.01 (0.8)
Combarro	85.8	62.5	0	0

Table S11. Summary of the results of the final linear models used to test the effects of the fixed factors Past salinity (3 levels: 35-35, 10-25 and 5-20), Habitat (2 levels: Bare sediment and *Zostera noltei*) and the random factor Basket (6 levels) on the increases in shell growth and tissue weight in juvenile clams. Significant effects are highlighted in bold, and asterisks indicate *p* levels close to statistical significance. The superscript † indicates models in which the variance structure was specified.

Variable	Species	Site	Factor	df	F	<i>p</i>	Random effects		
							Variance	SD	
Shell growth	<i>Venerupis corrugata</i>	Noia	Past salinity	2, 26	3.821	0.035			
			Habitat	1, 26	4.059	0.054*			
			Basket				0.055	0.234	
	<i>Ruditapes decussatus</i>	Combarro	Basket				0.159	0.399	
			Noia [†]	Habitat	1, 31	3.596	0.067*		
				Basket				0.128	0.355
	<i>Ruditapes philippinarum</i>	Combarro	Basket				0.174	0.418	
			Noia	Basket				0.125	0.353
				Basket				0.707	0.841
	Flesh growth	<i>Venerupis corrugata</i>	Noia [†]	Past salinity	1, 24	3.971	0.032		
Habitat				1, 24	0.539	0.469			
Habitat x Past salinity				1, 24	5.044	0.015			
Basket							1 · 10 ⁻⁴	0.010	
Combarro [†]		Past salinity	1, 22	3.332	0.082*				
		Basket				3.9 · 10 ⁻⁵	0.006		
		<i>Ruditapes decussatus</i>	Noia [†]	Past salinity	2, 249	5.097	0.007		
				Habitat	1, 249	11.141	0.001		
Habitat x Past salinity				2, 249	5.153	0.007			
Combarro [†]		Past salinity	2, 184	27.359	<0.001				
		Habitat	1, 184	9.517	0.024				
		Habitat x Past salinity	2, 184	10.481	<0.001				
		<i>Ruditapes philippinarum</i>	Noia	Past salinity	2, 299	2.374	0.095*		
Condition index		<i>Venerupis corrugata</i>	Combarro	Basket				464.732	21.558
	Habitat			1, 22	4.185	0.053*			
	Basket						93.317	9.660	
	<i>Ruditapes decussatus</i>	Noia	Past salinity	2, 31	2.664	0.086*			
			Basket				131.836	11.482	
			Combarro	Basket				48.484	6.963
<i>Ruditapes philippinarum</i>	Noia	Habitat	1, 32	2.815	0.103				
		Basket				121.942	11.043		
		Combarro	Basket				50.654	7.117	

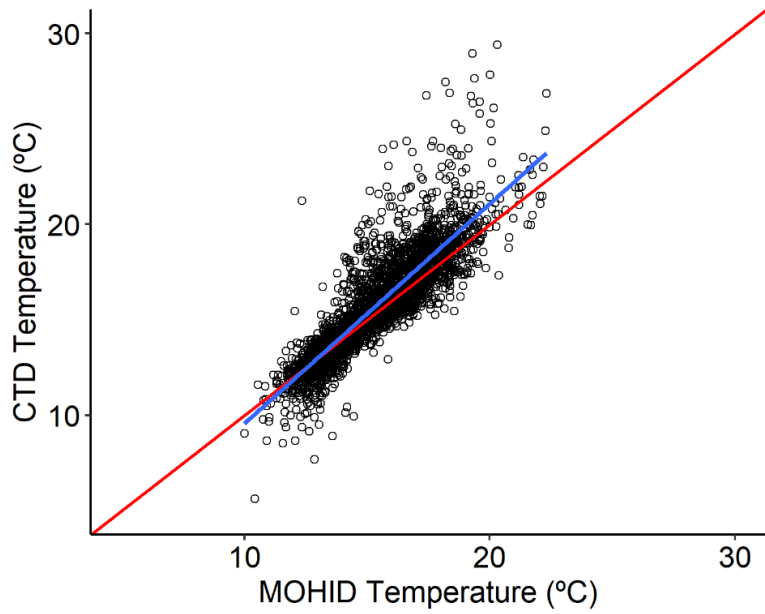


Figure S1. Regression between CTD and MOHID seawater temperatures measured between 02-01-2020 and 01-01-2021 at Noia. Red line is the 1:1 line and the blue line the fit of the regression model.

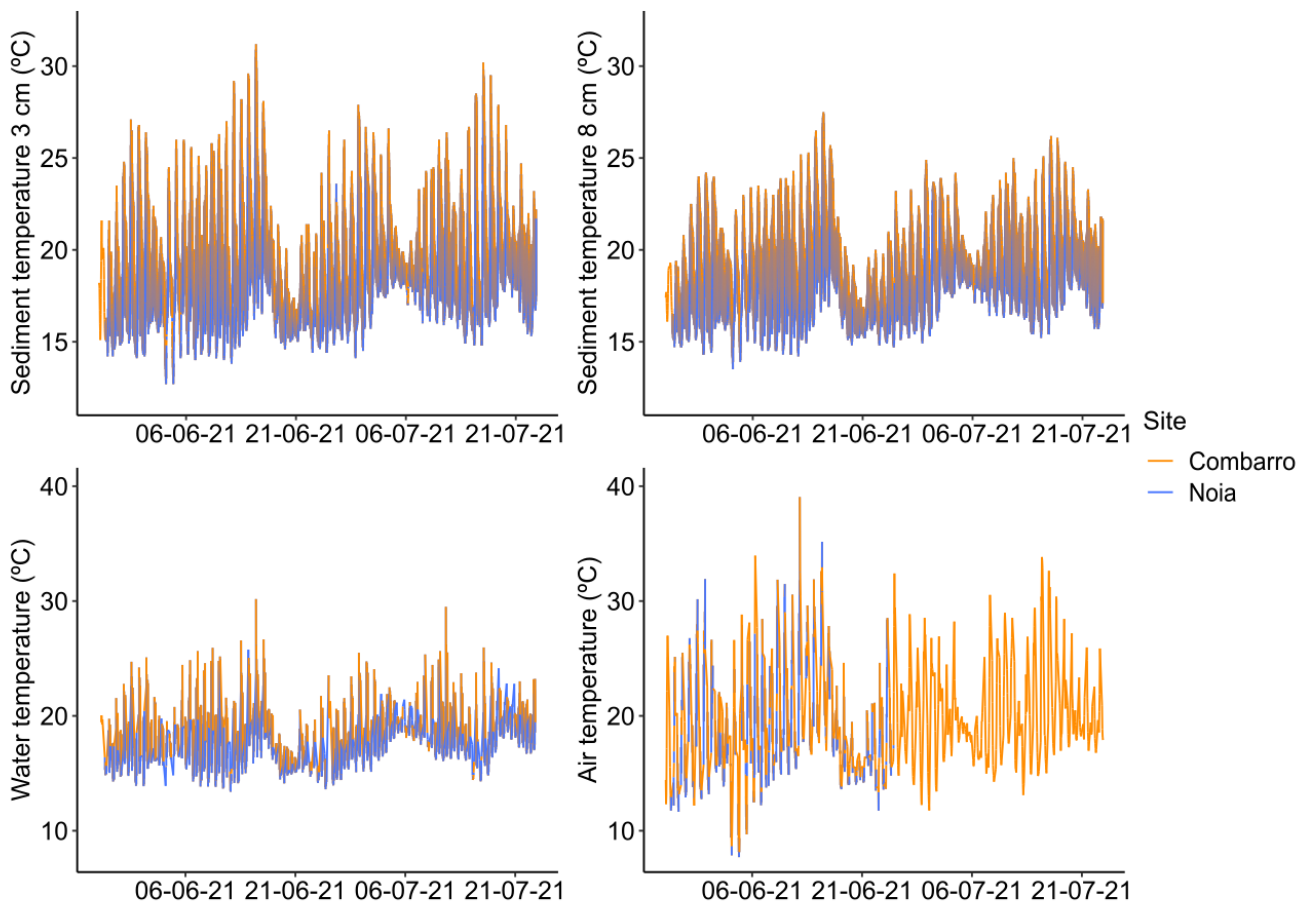


Figure S2. Temperatures recorded in the sediment (3 and 8 cm depth), in seawater during immersion and in air during emersion at the two sites.

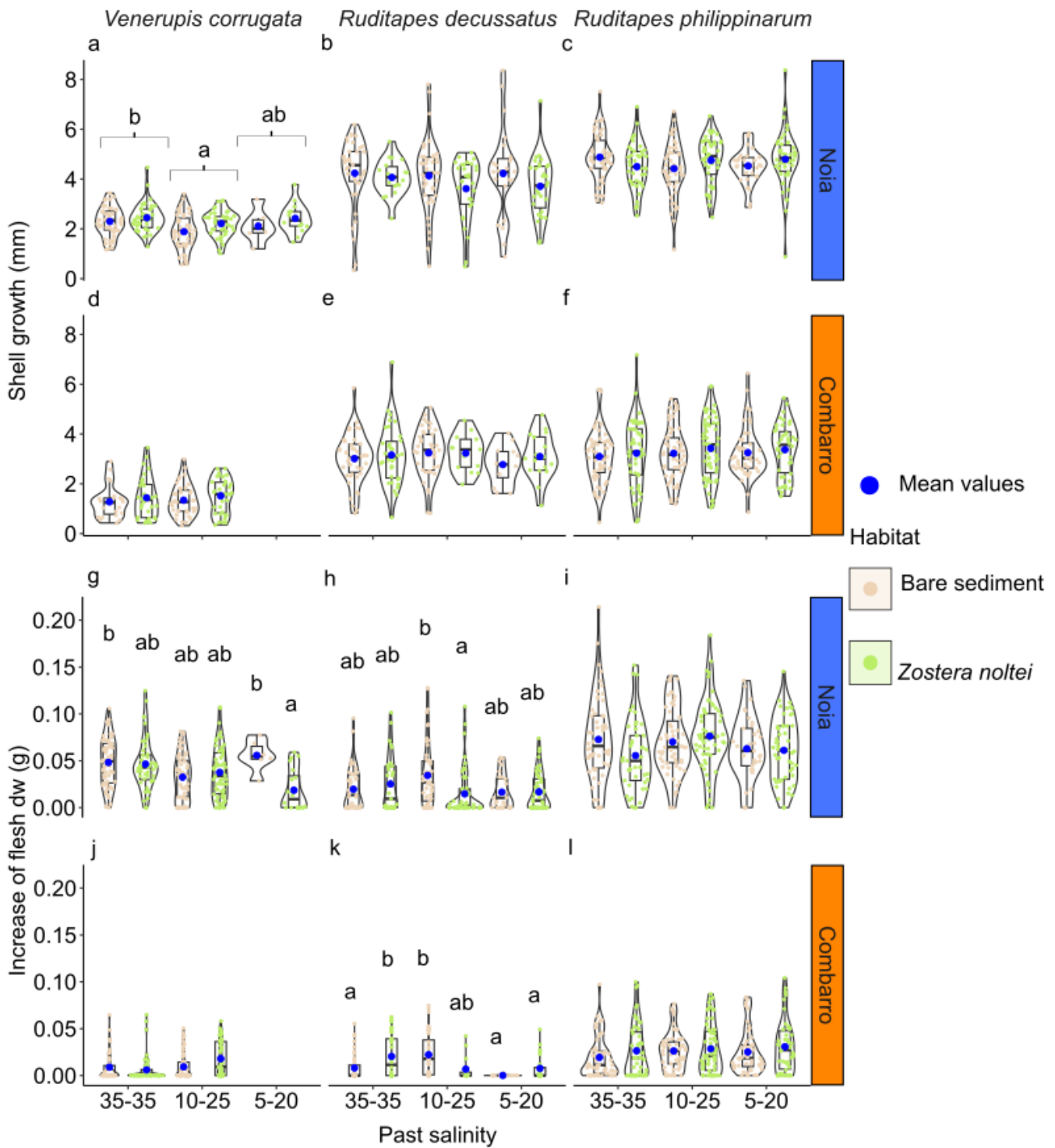


Figure S3. Violin plots showing increases in shell growth ($n = 6 - 60$) (a-f) and flesh dry weight increment ($n = 6 - 62$) (g-l) in clams in bare sediment and mixed together with *Zostera noltei* in the transplant experiment in the Noia and Combarro sites.

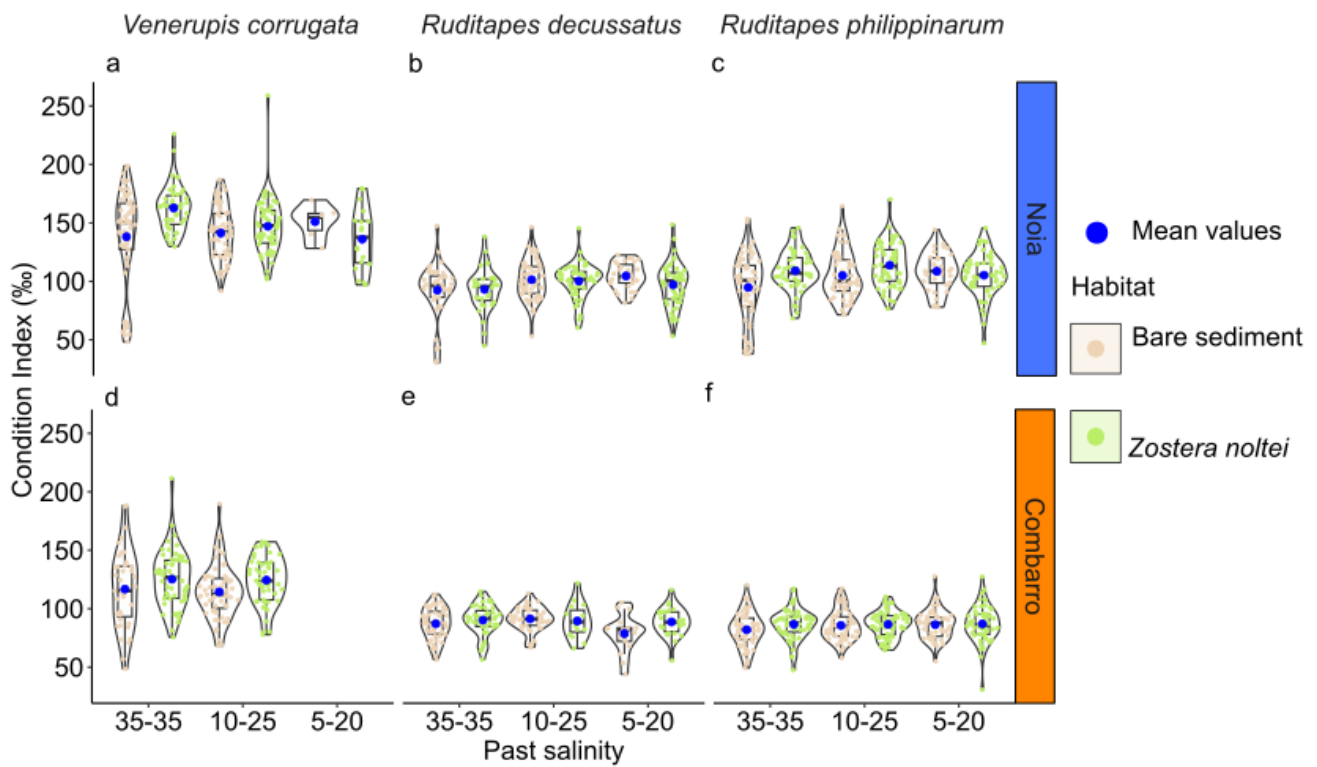


Fig. S4. Violin plots showing the condition index ($n = 6 - 62$) of clams in bare sediment and mixed together with *Zostera noltei* in the transplant experiment in the Noia and Combarro sites.

LITERATURE CITED

1. Barton, K., 2022. MumIn. Multi-Model Inference. R package version 1.47.1. <https://CRAN.R-project.org/package=MumIn>