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Similar metabolic responses of co-occurring post-settlement mussels to temperature change despite distinct geographical distributions

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Supplementary material:

Table S1: The model selection process is displayed for each comparison for the variables size-corrected oxygen consumption (MO_2) in response to species (Sp), temperature (T) and month (M). The model best explaining respiration rate (bold and underlined) was selected based on the lowest Akaike's information criterion (AIC) value for stepwise exclusion of interaction terms. A "*" denotes both a plus (+) and an interaction (x) sign. For Species and -5 °C, significant interactions occurred for Sp x M (ANOVA; F = 35.6, p < 0.001) and Sp x T (F = 6.7, p = 0.01) in model 1, but the effect of species was not significant for model 5 (F = 0.0, p = 1.0). For Species and +5 °C, significant interactions occurred for Sp x M (F = 35.56, p < 0.001) and Sp x T (F = 5.0, p = 0.01) in model 1, but the effect of species was not significant (F = 0.0, p = 1.0) for model 2.

Species and -5 °C	**Species and +5 °C**
1. m1: gls(MO_2~Sp * T * M) (AIC: 89.87)	1. m1: gls(MO_2~Sp * T * M) (AIC: 117.29)
2. m2: gls(MO_2 ~ Sp + T + M + Sp x T + Sp x M + T x M) (AIC: 88.03)	**2. <u>m2: gls(MO_2 ~ Sp + T + M + Sp x T + Sp x M + T x M (AIC: 119.97)</u>**
3. m31: gls(MO_2 ~ Sp + T + M + Sp x M + T x M) (AIC: 89.76)	3. m31: gls(MO_2 ~ Sp + T + M + Sp x M + T x M) (AIC: 132.31)
4. m32: gls(MO_2 ~ Sp + T + M + Sp x T + T x M) (AIC: 120.62)	4. m32: gls(MO_2 ~ Sp + T + M + Sp x T + T x M (AIC: 174.74)
5. <u>m33: gls(MO_2 ~ Sp + T + M + Sp x T + Sp x M) (AIC: 86.94)</u>	5. m33: gls(MO_2 ~ Sp + T + M + Sp x T + Sp x M) (AIC: 148.72)
6. m4: gls(MO_2 ~ Sp + T + M) (AIC: 122.89)	6. m4: gls(MO_2 ~ Sp + T + M) (AIC: 191.73)

Table S1 continued: The "†" indicates significant T x M interactions (ANOVA, $p < 0.001$).

***Mytilus* and -5 °C**	***Mytilus* and +5 °C**
1. <u>m1: gls(*M*O$_2$ ~T + M + T x M†) (AIC: 41.4)</u>	**1. <u>m1: gls(*M*O$_2$~T + M + T x M†) (AIC: 54.79)</u>**
2. m2: gls(*M*O$_2$ ~ T + M) (AIC: 71.3)	**2.** m2: gls(*M*O$_2$ ~ T + M) (AIC: 67.46)
***Perna* and -5 °C**	***Perna* and +5 °C**
1. m1: gls(*M*O$_2$ ~ T + M + T x M) (AIC: 120.77)	**1. <u>m1: gls(*M*O$_2$ ~ T + M + T x M†) (AIC: 73.09)</u>**
2. <u>m2: gls(*M*O$_2$ ~ T + M) (AIC: 117.67)</u>	2. m2: gls(*M*O$_2$ ~ T + M) (AIC: 108.38)

Table S2: The mean (± S.D.) mass-specific oxygen consumption rates (nmol O_2 min^{-1} μg^{-1}) are displayed for each month and treatment with the mean (± S.D.) animal lengths (µm) in parentheses.

	Mytilus			***Perna***		
	+5 °C	**Collection**	**-5 °C**	**+5 °C**	**Collection**	**-5 °C**
May 18	0.0009 ± 0.0007	0.0003 ± 0.0003	0.0002 ± 0.0003	0.001 ± 0.0009	0.0005 ± 0.0006	
	(744.1 ± 297.1)	(859.2 ± 544.8)	(635.0 ± 130.3)	(660.0 ± 240.5)	(605.3 ± 185.6)	
Jul 18	0.0015 ± 0.001	0.0009 ± 0.0005	0.0004 ± 0.0003	0.001 ± 0.0004	0.001 ± 0.001	
	(741.9 ± 281.2)	(752.8 ± 213.1)	(763.4 ± 248.5)	(574.2 ± 141.5)	(681.4 ± 307.1)	
Oct 18	0.0004 ± 0.0004	0.0003 ± 0.0002	0.0003 ± 0.0002	0.0002 ± 0.0002	0.0002 ± 0.0003	0.0002 ± 0.0001
	(1070.1 ± 385.5)	(1085.1 ± 396.5)	(958.0 ± 237.8)	(1443.6 ± 252.3)	(1652.8 ± 376.2)	(1309.7 ± 201.6)
Dec 18	0.002 ± 0.001	0.001 ± 0.0006	0.0009 ± 0.0006	0.003 ± 0.003	0.001 ± 0.001	0.0009 ± 0.001
	(638.0 ± 184.3)	(627.5 ± 223.4)	(682.9 ± 196.0)	(555.6 ± 85.8)	(674.3 ± 187.0)	(664.1 ± 177.6)
Jan 19				0.003 ± 0.001	0.0004 ± 0.0005	0.0002 ± 0.0002
				(1207.7 ± 230.0)	(1542.0 ± 300.2)	(1708.1 ± 354.5)

R scripts:

Size correction

The MO_2 response variable was adjusted for the size covariate by fitting a GLS model (Species1$fitted) with the covariate (log MO_2~logDry Mass) (step 1), and by generating a new corrected MO_2c response variable from the residuals (Species1$log MO_2c<-Species1$log MO_2-Species1$fitted) (step 2).

Pairwise comparisons of MO_2 between species and temperatures for different months

Post-hoc Tukey HSD test-95 % family-wise confidence levels for interaction ANOVA models (aov(log MO_2c~Temp*Month*Species)) corresponding to the full GLS model (Table S1) were performed.