

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

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| 1 | Similar metabolic responses of co-occurring post-settlement mussels to |
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| 2 | temperature change despite distinct geographical distributions |
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| | |

14 Supplementary material:

| 15 | Table S1: The model selection process is displayed for each comparison for the variables size-corrected oxygen consumption (MO ₂) in response |
|----|--|
| 16 | to species (Sp), temperature (T) and month (M). The model best explaining respiration rate (bold and underlined) was selected based on the |
| 17 | lowest Akaike's information criterion (AIC) value for stepwise exclusion of interaction terms. A "*" denotes both a plus (+) and an interaction |
| 18 | (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 |
| 19 | 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 |
| 20 | 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 $(F = 0.0, p = 1.0)$ for model $(F = $ |
| 21 | 2. |

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

| 22 | Table S1 continued: The " [†] | " indicates significant T x M intera | ctions (ANOVA, $p < 0.001$). |
|----|--|--------------------------------------|-------------------------------|

| Mytilus and -5 °C | Mytilus and +5 °C | | |
|--|---|--|--|
| | | | |
| 1. <u>m1: gls($MO_2 \sim T + M + T \ge M^{\dagger}$) (AIC: 41.4)</u> | 1. <u>m1: gls($MO_2 \sim T + M + T \ge M^{\dagger}$) (AIC: 54.79)</u> | | |
| 2. m2: gls($MO_2 \sim T + M$) (AIC: 71.3) | 2. m2: gls($MO_2 \sim T + M$) (AIC: 67.46) | | |
| | | | |
| Perna and -5 °C | Perna and +5 °C | | |
| Perna and -5 °C | Perna and +5 °C | | |
| <i>Perna</i> and -5 °C 1. m1: gls(<i>M</i> O ₂ ~ T + M + T x M) (AIC: 120.77) | <i>Perna</i> and +5 °C 1. <u>m1: gls(MO₂ ~ T + M + T x M[†]) (AIC: 73.09)</u> | | |
| <i>Perna</i> and -5 °C 1. m1: gls(<i>M</i> O ₂ ~ T + M + T x M) (AIC: 120.77) 2. m2: gls(<i>M</i> O ₂ ~ T + M) (AIC: 117.67) | <i>Perna</i> and +5 °C 1. <u>m1: gls(MO₂ ~ T + M + T x M[†]) (AIC: 73.09)</u> 2. m2: gls(MO ₂ ~ T + M) (AIC: 108.38) | | |

Table S2: The mean (\pm S.D.) mass-specific oxygen consumption rates (nmol O₂ min⁻¹ μ g⁻¹) are displayed for each month and treatment with the

25 mean (\pm S.D.) animal lengths (μ m) 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_2c -Species1\$fitted) (step 2).

Pairwise comparisons of MO₂ between species and temperatures for different months Post-hoc Tukey HSD test-95 % family-wise confidence levels for interaction ANOVA models (aov(log MO₂c~Temp*Month*Species)) corresponding to the full GLS model (Table S1) were performed.