|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **“ambient pCO2”** | **“ambient pCO2 x copepodamides”** | **“elevated pCO2”** | **“elevated pCO2 x copepodamides”** |
| pCO2 (µatm) | 400 | 400 | 1100 | 1100 |
| pHNBS | 8.14 | 8.09 | 7.64 | 7.65 |
| AT ( µmolkg-1) | 2080 | 2080 | 2080 | 2080 |
| Salinity (psu) | 26.0 | 26.0 | 26.0 | 26.0 |
| Temperature (°C) | 16.0 | 16.0 | 16.0 | 16.0 |

Table S1. Carbonate chemistry parameters.

*Temperature, salinity, pCO2, and pHNBS were measured. Total alkalinity (AT) was estimated using long-term salinity:alkalinity relationship data for the location of the experiment (r=0.94) and pHT was calculated from the temperature, salinity, pCO2, and total alkalinity using CO2calc.*

|  |
| --- |
| Table S2. Generalized Linear Model (GLM) results for chain length in response to copepodamides and elevated *p*CO2. Poisson distribution with treatment as fixed factors. Number of observations 1200 per treatment |
| **Species** |  | **Estimate** | **S.E**  | **z value** | **﻿Pr(>|z|)** | **AIC** | **AIC (replicate nested)** |
| *T. Rotula* |   |   |   |   |   | 3751.3 | 3753.3 |
|  | (Intercept) | 0.36 | 0.04 | 7.41 | 1.28e-13 \*\*\* |  |  |
|  | Elevated pCO2  | -0.13 | 0.07 | -1.79 | 0.07 |  |  |
|  | Copepodamide control | 1.20 | 0.06 | 21.89 | < 2e-16 \*\*\* |  |  |
| Interaction | Elevated pCO2 : Copepodamide control | -0.18 | 0.08 | -2.21 | 0.0269 \* |  |  |
|  |  |  |  |  |  |  |  |
| *C. curvisetus* |   |   |   |   |   | 4531.1 | 4533.1 |
|  | (Intercept) | 1.07 | 0.03 | 31.82 | < 2e-16 \*\*\* |  |  |
|  | Elevated pCO2  | 0.04 | 0.05 | 0.90 | 0.37 |  |  |
|  | Copepodamide control | 0.39 | 0.04 | 8.81 | < 2e-16 \*\*\* |  |  |
| Interaction | Elevated pCO2 : Copepodamide control | -0.09 | 0.06 | -1.43 | 0.15 |  |  |
|  |  |  |  |  |  |  |  |
| *C. affinis* |   |   |   |   |   | 3725.8 | 3727.8 |
|  | (Intercept) | 1.06 | 0.03 | 31.04 | < 2e-16 \*\*\* |  |  |
|  | Elevated pCO2  | -0.44 | 0.05 | -8.11 | 4.93e-16 \*\*\* |  |  |
|  | Copepodamide control | -0.06 | 0.05 | -1.32 | 0.19 |  |  |
| Interaction | Elevated pCO2 : Copepodamide control | 0.15 | 0.08 | 1.97 | 0.0485 \* |  |  |
|  |  |  |  |  |  |  |  |
| *S. marinoi* |   |   |   |   |   | 4284.9 | 4286.9 |
|  | (Intercept) | 0.47 | 0.05 | 10.19 | < 2e-16 \*\*\* |  |  |
|  | Elevated pCO2  | 0.00 | 0.06 | 0.07 | 0.95 |  |  |
|  | Copepodamide control | 1.10 | 0.05 | 20.89 | < 2e-16 \*\*\* |  |  |
| Interaction | Elevated pCO2 : Copepodamide control | 0.03 | 0.07 | 0.35 | 0.73 |  |  |
|  |  |  |  |  |  |  |  |
| Z value = parameter estimated. Total number of observations per treatment 1200. Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1 |

|  |
| --- |
| Table S3. Generalized Linear Model (GLM) results for silica content in response to copepodamides and elevated *p*CO2 n=6 per treatment |
| **Species** |  | **Estimate** | **S.E**  | **z value** | **﻿Pr(>|z|)** | **AIC** |
| *C. curvisetus* |   |   |   |   | 46.2 |
|  | (Intercept) | 2.071 | 0.230 | 9.007 | 0.000 | \*\*\* |
|  | Elevated pCO2  | 0.037 | 0.325 | 0.114 | 0.910 |  |
|  | Copepodamide control | -0.168 | 0.325 | -0.518 | 0.610 |  |
| Interaction | Elevated pCO2 : Copepodamide control | 0.909 | 0.460 | 1.975 | 0.062 | . |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *C. affinis* |   |   |   |   |   | 72.8 |
|  | (Intercept) | 3.997 | 0.466 | 8.575 | 0.000 | \*\*\* |
|  | Elevated pCO2  | -0.167 | 0.631 | -0.264 | 0.794 |  |
|  | Copepodamide control | 0.956 | 0.631 | 1.515 | 0.146 |  |
| Interaction | Elevated pCO2 : Copepodamide control | -1.421 | 0.872 | -1.630 | 0.120 |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *S. marinoi* |   |   |   |   |   | -8.4 |
|  | (Intercept) | 1.132 | 0.073 | 15.536 | 0.000 | \*\*\* |
|  | Elevated pCO2  | -0.432 | 0.108 | -3.997 | 0.001 | \*\*\* |
|  | Copepodamide control | 0.215 | 0.103 | 2.089 | 0.050 |  |
| Interaction | Elevated pCO2 : Copepodamide control | -0.156 | 0.149 | -1.046 | 0.309 |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Z value = parameter estimated. Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1 |

Table S4. Aligned Rank Transform (ART) results for *T. rotula* silica content

|  |  |  |  |
| --- | --- | --- | --- |
| **Aligned Rank Transform (ART)** |  |  |  |
|   |   | **Df** | **Df.res** | **F Value** | **Pr(>F)** |
| **T. rotula- Silica content** |  |  |  |  |
| 1 | pCO2 | 1 | 20 | 0.516 | 0.481 |
| 2 | Copepodamide | 1 | 20 | 0.145 | 0.708 |
| 3 | pco2:Copepodamide | 1 | 20 | 1.375 | 0.255 |

Table S5. *A. minutum* 2-way ANOVA results for toxin content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2- way ANOVA** |  |  |  |  |  |
| ***A. minutum*- Toxin content**  |  |  |  |  |
|   | **Df** | **Sum Sq** | **Mean Sq** | **F Value** | **Pr (>F)** |   |
| pCO2 | 1 | 1273.76 | 1273.76 | 10.08 | 0.005 | \*\* |
| Copepodamide | 1 | 722.77 | 722.77 | 5.72 | 0.027 | \* |
| pCO2: Copepodamide | 1 | 73.81 | 73.81 | 0.58 | 0.454 |  |
| Residuals | 20 | 2527.81 | 126.39 |  |  |  |

Table S6. *C. curvisetus* 2-way ANOVA results for growth rate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***C. curvisetus*- Growth rate** |  |  |  |  |  |
|   | **Df** | **Sum Sq** | **Mean Sq** | **F Value** | **Pr (>F)** |   |
| pCO2 | 1 | 0.333 | 0.333 | 29.02 | 0.000 | \*\*\* |
| Copepodamide | 1 | 0.110 | 0.110 | 9.62 | 0.006 | \*\* |
| pCO2: Copepodamide | 1 | 0.005 | 0.005 | 0.43 | 0.517 |  |
| Residuals | 20 | 0.230 | 0.011 |  |  |  |
|  |  |  |  |  |  |  |
| Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1 |  |  |  |

Table S7. Aligned Rank Transform (ART) results for *T. rotula*, *C. affinis*, *S. marinoi* and *A. minutum* growth rate.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   |   |   |   |   |   |   |
| **Aligned Rank Transform (ART)** |  |  |  |  |  |
|   |   | **Df** | **Df.res** | **F Value** | **Pr(>F)** |   |
| ***T. rotula*- Growth rate** |  |  |  |  |  |  |
| 1 | pCO2 | 1 | 20 | 60.99 | 0.000 | \*\*\* |
| 2 | Copepodamide | 1 | 20 | 14.76 | 0.001 | \*\* |
| 3 | pco2:copepodamide | 1 | 20 | 0.77 | 0.389 |  |
|  |  |  |  |  |  |  |
| ***C. affinis*- Growth rate** |  |  |  |  |  |  |
| 1 | pCO2 | 1 | 20 | 21.85 | 0.000 | \*\*\* |
| 2 | Copepodamide | 1 | 20 | 21.85 | 0.000 | \*\*\* |
| 3 | pCO2: Copepodamide | 1 | 20 | 2.40 | 0.137 |  |
|  |  |  |  |  |  |  |
| ***S. marinoi*- Growth rate** |  |  |  |  |  |
| 1 | pCO2 | 1 | 20 | 13.76 | 0.001 | \*\* |
| 2 | Copepodamide | 1 | 20 | 3.07 | 0.095 |  |
| 3 | pCO2: Copepodamide | 1 | 20 | 5.11 | 0.035 | \* |
|  |  |  |  |  |  |  |
| ***A. minutum*- Growth rate** |  |  |  |  |  |
| 1 | pCO2 | 1 | 20 | 12.99 | 0.002 | \*\* |
| 2 | Copepodamide | 1 | 20 | 7.84 | 0.011 | \* |
| 3 | pCO2: Copepodamide | 1 | 20 | 0.59 | 0.453 |  |
|  |  |  |  |  |  |  |

Table S8: Results from Levene’s tests and Shapiro- wilks

|  |  |
| --- | --- |
|  |  |
|  | **Levene’s test** | **Shapiro- wilks test** |
|  | **F- value** | **Pr (>F)** | **W** | **p-value** |
| **Growth** |   |   |   |   |
| *T. rotula* | 0.21 | 0.888 | 0.899 | 0.021 |
| *C. curvisetus* | 0.12 | 0.946 | 0.955 | 0.343 |
| *C. affinis* | 2.86 | 0.063 | 0.793 | 0.000 |
| *S. marinoi* | 0.94 | 0.441 | 0.903 | 0.025 |
| *A. minutum* | 3.98 | 0.02255 \* | 0.959 | 0.420 |
|  |  |  |  |  |
| **Toxin** |   |   |   |   |
| *A. minutum* | 2.90 | 0.060 | 0.930 | 0.100 |
|  |  |  |  |  |
| **Silica** |  |  |  |  |
| *T. rotula* | 3.29 | 0.042 | 0.932 | 0.109 |
| *C. curvisetus* | 2.71 | 0.073 | 0.957 | 0.379 |
| *C. affinis* | 0.36 | 0.786 | 0.959 | 0.435 |
| *S. marinoi* | 0.11 | 0.951 | 0.942 | 0.202 |