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| **Table S1:** Summary of metrics recorded for life history traits in this study | | | |
| **Metric** | **Timing of recording** | **Why the metric was used** | **Variables that incorporated this data** |
| Adult lifespan | From the day the mother entered her final molt until her death | Used to estimate the longevity of sexually mature females | Female longevity |
| Egg gestation time | From the day the mother formed her egg sac until the day the eggs hatched | Used to estimate the generation time of indv. clutches before hatch | Indv. clutch gestation time, average egg gestation time per female |
| Hatched offspring per clutch | On the clutch hatch date | Used to quantify the reproductive output and allocation of resources of females per clutch | Indv. clutch size, average clutch size per female, lifetime offspring produced, largest clutch size |
| The bout number of the current clutch | On the clutch hatch date | Used to estimate the effect of increasing reproductive effort over time on reproductive traits | Clutch number |
| Age of female on clutch hatch date | On the clutch hatch date | Used to estimate the effect of aging on reproductive traits | Mother age |
| Number of offspring per clutch to survive | Two weeks after the clutch hatch date | Used to estimate offspring fitness | Survival ratio per clutch, average survival ratio per female |
| Number of offspring per clutch to reach juvenile stage | Two weeks after the clutch hatch date (halfway point of *T. californicus* development cycle) | Used to estimate offspring fitness and growth rate | Offspring development ratio per clutch, average development ratio per female |
| Length and width of 2-3 offspring per clutch sampled at random | On the clutch hatch date | Used to estimate offspring fitness and female allocation of resources | Offspring size, average offspring size per clutch and per female |

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| **Table S2**: Covariances in reproductive traits with the effect of aging and increasing reproductive bouts among and within individual copepod mothers. Values are estimates from a Bayesian model and may be slightly different each time the model is run. | | | | |
| **Predictor** | **Response** | **Sample size** | **CovAmong** | **CovWithin** |
| Mother age | Clutch size | 178 | -0.01 | -0.21 |
|  | Offspring size | 227 | 4.72 | -364.70 |
|  | Survival ratio | 168 | -0.01 | -0.02 |
|  | Dev. ratio | 168 | -0.01 | -0.04 |
|  | Egg dev. | 178 | 0.02 | 0.08 |
| Clutch number | Clutch size | 178 | 0.04 | -0.16 |
|  | Offspring size | 227 | 1.13 | -287.40 |
|  | Survival ratio | 168 | 0.01 | -0.02 |
|  | Dev. ratio | 168 | 0.01 | -0.03 |
|  | Egg dev. | 178 | -0.004 | 0.03 |

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| **Table S3:** Results from our generalized linear models analyzing the relationship between clutch size, offspring size, egg gestation time, and other reproductive traits. **Bold** values are statistically significant. | | | | | | | |
| **Predictor** | **Response** | **Sample size** | **Effect size** | **β** | **Lower CI** | **Upper CI** | **p-value** |
| Clutch size | Survival ratio | 168 | Odds ratio | 4.63 | -0.13 | 9.61 | 0.057 |
|  | Dev. ratio | 168 | Odds ratio | 3.45 | -1.05 | 8.16 | 0.135 |
| Offspring size | Survival ratio | 222 | Odds ratio | 11.94 | -24.51 | 66.00 | 0.575 |
|  | Dev. ratio | 222 | Odds ratio | 2.89 | -27.99 | 47.00 | 0.876 |
|  | **Clutch size** | 227 | Odds ratio | **-9.73** | **-16.63** | **-2.24** | **0.012** |
| Egg gest. time | **Offspring size** | 227 | Reg. Coef. | **316.59** | **127.29** | **500.46** | **<0.001** |
|  | **Clutch size** | 178 | Odds ratio | **-10.57** | **-16.96** | **-3.70** | **0.003** |
|  | **Survival ratio** | 168 | Odds ratio | **-26.63** | **-44.08** | **-3.73** | **0.026** |
|  | Dev. ratio | 168 | Odds ratio | -19.46 | -37.57 | 3.92 | 0.096 |
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| **Table S4:**  Covariances in reproductive traits among and within individual copepod mothers. Values are estimates from a Bayesian model and may be slightly different each time the model is run. | | | | |
| **Predictor** | **Response** | **Sample Size** | **CovAmong** | **CovWithin** |
| Clutch Size | Survival ratio | 168 | 0.05 | 0.08 |
|  | Development ratio | 168 | 0.05 | 0.07 |
| Offspring size | Survival ratio | 222 | 0.06 | -0.01 |
|  | Development ratio | 222 | 0.04 | 0.003 |
|  | Clutch size | 227 | -0.10 | -174.30 |
| Egg development | Offspring size | 227 | -0.001 | 188.20 |
|  | Clutch size | 178 | -0.02 | -0.10 |
|  | Survival ratio | 168 | -0.02 | -0.02 |
|  | Development ratio | 168 | -0.01 | -0.03 |