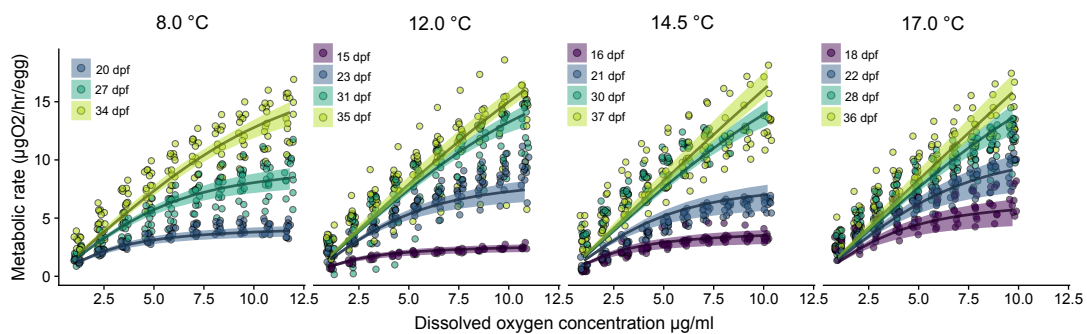


1 SUPPLEMENTARY FIGURES



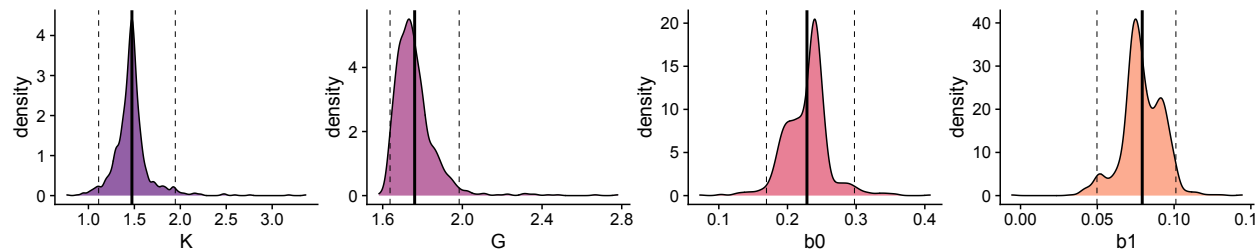
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3 **Figure S1:** Observed metabolic rates of individual eggs (circles) as a function of O₂ in the
4 respirometry chamber at intervals of 10% saturation. The developmental stages of experimental
5 embryos (days post fertilization) are denoted by color. Lines represent predictions of the
6 biophysical model (95% CI: bands). The two panels show data from the highest and lowest
7 experimental temperatures

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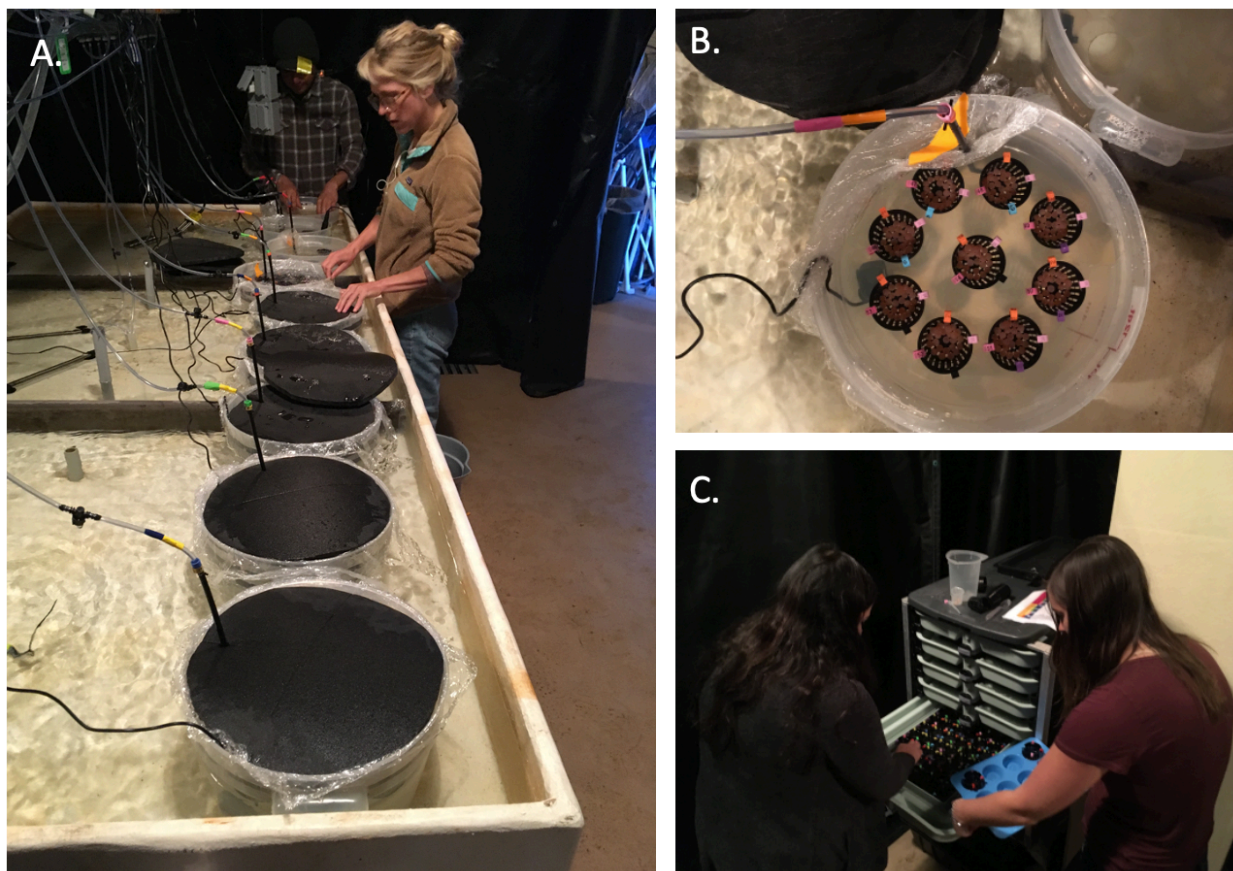
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12 **Figure S2:** Probability distribution, mean (solid line), and 95% CI for model parameters (dashed
13 lines). Probability distributions for parameters were generated by a non-parametric bootstrapping
14 (N=1000).

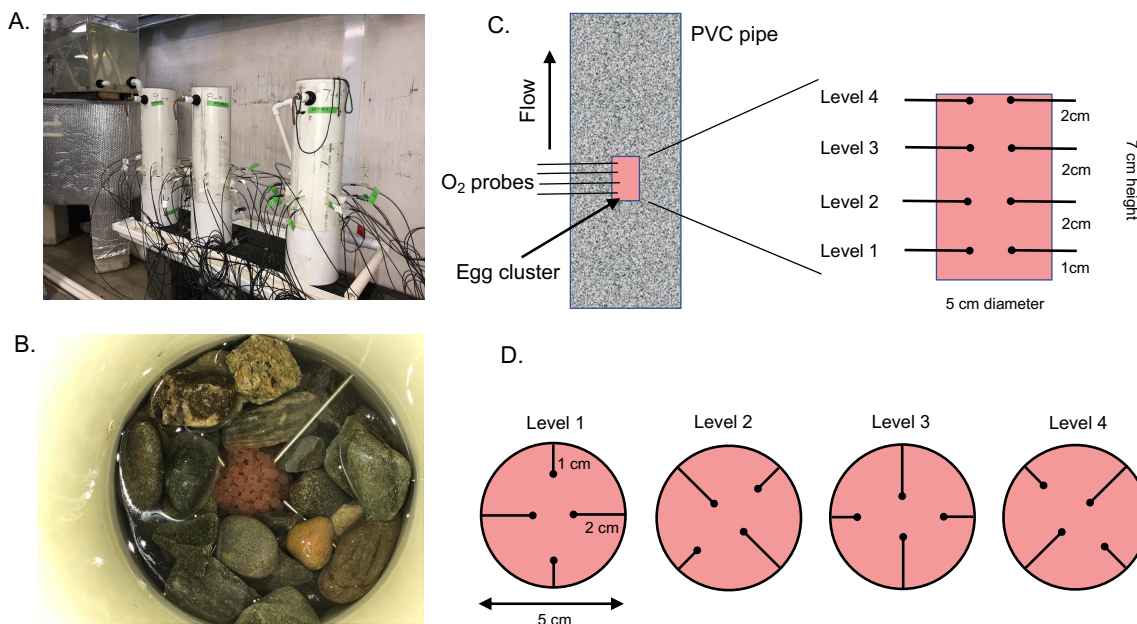
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17 **Figure S3.** Experimental setup for oxygen supply/demand survival experiments. [A] The 9
 18 experimental aquaria are divided among 3 sections of a water bath. Aquaria in each of the three
 19 sections of the water bath were maintained at one of three temperatures (12, 14.5, 17 °C). Within
 20 each partition, each aquarium received water from one of 3, 500-l reservoirs (not pictured)
 21 maintained at three O₂ levels (saturation, 5.0 and 2.5 μg ml⁻¹). A layer of polyethylene wrap and
 22 a foam lid was placed on top of each aquarium to minimize gas exchange. [B] Top-down view of
 23 an experimental aquaria, with the 9 replicate experimental baskets originally containing 25
 24 embryos each. The water inflow spigot (at 12 o'clock), and the recirculating pump (at 9 o'clock)
 25 can both be seen. [C] Before and after the experimental exposure period embryos were
 26 maintained in a Heath (Flex-a-lite Consolidated) recirculating incubation tray.
 27

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30 **Figure S4.** Measuring O₂ variability within egg clusters. **[A]** External view of gravel upwelling
 31 chambers. **[B]** Downward facing view of the egg cluster within the PVC pipe before being
 32 covered up with gravel. The top layer of the O₂ probes can be seen, although they are not yet
 33 pushed into their final position. **[C]** Schematic of a vertical cross-section of the PVC pipe
 34 showing the cluster position within the PVC pipe. On the right is a close-up view of the relative
 35 vertical positions of each layer of O₂ probes. **[D]** Horizontal cross sections of each vertical layer
 36 of O₂ probes shows the position of each of the 4 O₂ probes within each vertical layer. The
 37 diameter of the circle represents the approximate diameter of the egg pocket (5 cm).
 38