Supplementary material

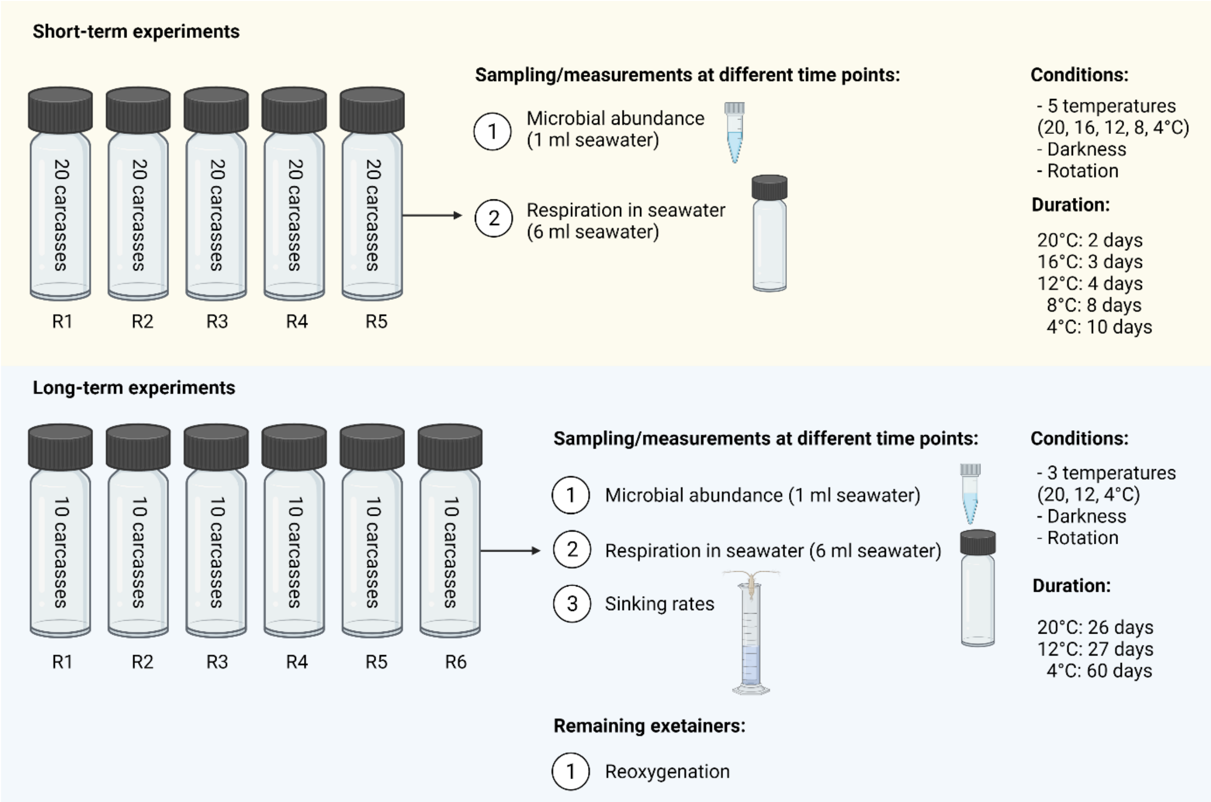

Figure S1. Conceptual diagram of short- and long-term experiments. R= replicate. Created with BioRender.

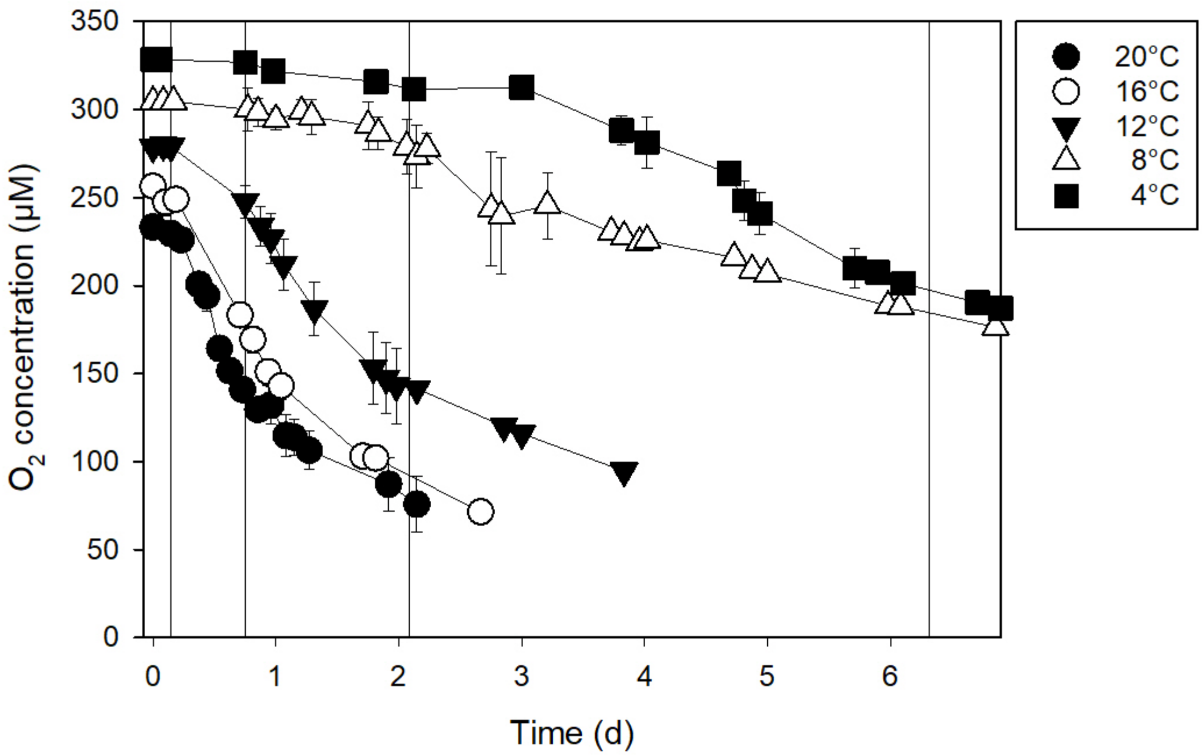

Figure S2. Oxygen concentration over time in short-term experiments as a function of temperature. Means and standard deviations of 5 replicates are shown. Vertical lines indicate the time intervals used for the calculation of the respiration rates in Fig. 2.

Table S1. Statistics of the effect of the three killing procedures on rates of total microbial respiration per time interval.

Time interval (h)	Factor levels	Test	Respiration rates	Significant differences
0–2	Freezing Acetic acid Anoxia	One-way ANOVA	F = 1.086 df = 2,10 p = 0.383	
2–18	Freezing Acetic acid Anoxia	One-way ANOVA, Holm-Sidak *post-hoc* test	F = 261.469 df = 2,10 p < 0.001	Between all treatments
18–24	Freezing Acetic acid Anoxia	One-way ANOVA	F = 3.848 df = 2,10 p = 0.067	
24–48	Freezing Acetic acid Anoxia	One-way ANOVA	F = 0.461 df = 2,10 p = 0.646	

Table S2. Statistics of the effect of the temperature on rates of total microbial respiration per time interval.

Time interval (h)	Factor levels	Test	Respiration rates	Significant differences
0–3.5	20°C 16°C 12°C 8°C 4°C	Kruskal-Wallis one-way ANOVA on ranks, Dunn's *post-hoc* test	H = 16.983 df = 4 p = 0.002	
3.5–18	20°C 16°C 12°C 8°C 4°C	Kruskal-Wallis one-way ANOVA on ranks, Dunn's *post-hoc* test	H = 17.865 df = 4 p = 0.001	20°C vs 4°C 20°C vs 8°C 16°C vs 4°C
18–50	20°C 16°C 12°C 8°C 4°C	Kruskal-Wallis one-way ANOVA on ranks, Dunn's *post-hoc* test	H = 16.527 df = 4 p = 0.002	20°C vs 4°C 12°C vs 4°C
50–115.5	20°C 16°C 12°C 8°C 4°C	Kruskal-Wallis one-way ANOVA on ranks, Dunn's *post-hoc* test	H = 14.211 df = 3 p = 0.003	20°C vs 12°C 20°C vs 4°C
115.5–165.5	20°C 16°C 12°C 8°C 4°C	Kruskal-Wallis one-way ANOVA on ranks	H = 3.272 df = 3 p = 0.352	

Table S3. Statistics of the effect of the temperature on the abundance of free-living bacteria and the overall average of total and carcass-associated cumulative carbon loss.

Factor levels	Response variable	Test	Statistics	Significant differences
20°C 16°C 12°C 8°C 4°C	Microbial abundance	One-way ANOVA	$F = 1.876$ $df = 4$ $p = 0.136$	
20°C 12°C 4°C	Total cumulative carbon loss	Kruskal-Wallis One Way ANOVA on Ranks, Dunn's *post-hoc* test	$H = 22.452$ $df = 2$ $p < 0.001$	20°C vs 12°C 20°C vs 4°C
20°C 12°C 4°C	Carcass-associated cumulative carbon loss	Kruskal-Wallis One Way ANOVA on Ranks, Dunn's *post-hoc* test	$H = 17.559$ $df = 2$ $p < 0.001$	20°C vs 4°C 12°C vs 4°C

Table S4. Statistics of the differences in total versus carcass-associated cumulative carbon loss at 3 different temperatures (20, 12, and 4°C).

Temperature (°C)	Factor levels	Test	Statistics
20	Total cumulative carbon loss Carcass-associated cumulative carbon loss	Mann-Whitney rank sum test	$T = 190.0$ $p < 0.001$
12	Total cumulative carbon loss Carcass-associated cumulative carbon loss	Mann-Whitney rank sum test	$T = 110.0$ $p < 0.001$
4	Total cumulative carbon loss Carcass-associated cumulative carbon loss	Mann-Whitney rank sum test	$T = 86.0$ $p = 0.002$