The following supplement accompanies the article

Sea urchins in a high-CO_2 world: the influence of acclimation on the immune response to ocean warming and acidification

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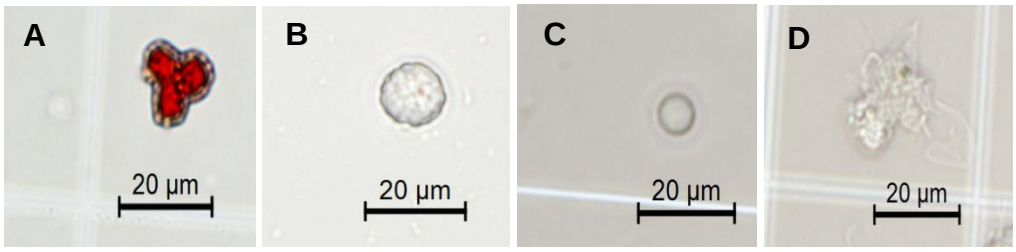

Figure S1. Types of coelomocytes collected from the coelomic fluid of *Heliocidaris erythrogramma*. A) red amoebocyte B) white amoebocyte C) vibratile cell D) phagocyte (petalloid).

Table S1. Temperature (°C) and pH_{NIST} ($\bar{x}$ ± SE) for experimental treatments (n = 5 per treatment) once target conditions were reached. Measurements were taken daily in each aquarium containing *Heliocidaris erythrogramma* (n = 20).

	1 Day		15 Days		30 Days	
Treatment	Temperature	pH	Temperature	pH	Temperature	pH
17°C / pH 8.15	17.04 (0.05)	8.15 (0.01)	16.96 (0.18)	8.17 (0.03)	17 (0.15)	8.17 (0.02)
17°C / pH 7.6	17.04 (0.09)	7.64 (0.01)	17.02 (0.08)	7.58 (0.06)	17.02 (0.08)	7.6 (0.05)
23°C / pH 8.15	23.02 (0.13)	8.16 (0.01)	22.88 (0.35)	8.16 (0.14)	22.92 (0.27)	8.17 (0.21)
23°C / pH 7.6	23.00 (0.12)	7.61 (0.02)	22.87 (0.37)	7.62 (0.03)	22.94 (0.29)	7.62 (0.03)

Table S2. Seawater carbonate system parameters ($\bar{x}$ ± SE) for 4 experimental temperature and pH treatments. pCO_2 (µatm), Ω_{Ca}, and Ω_{Ar} values were determined from pH_{NIST}, temperature, salinity, and total alkalinity (n = 5) using CO2SYS (Pierrot, 2006).

	pH 8.1.5		pH 7.6	
	17°C	23°C	17°C	23°C
pCO_2	389.72	399.00	1683.97	1681.87
	(1.97)	(2.94)	(17.23)	(9.66)
Ω_{ca}	3.98	4.70	1.24	1.56
	(0.01)	(0.02)	(0.01)	(0.01)
Ω_{Ar}	2.57	3.08	0.80	1.02
	(0.01)	(0.01)	(0.01)	(0.00)

Table S3. Types of coelomocytes contributing to the dissimilarity in cell counts of coelomic fluid collected from *Heliocidaris erythrogramma* exposed to temperature and pH treatments for 1 day (n = 5 per treatment).

Treatment	Average Dissimilarity (%)	Type of Coelomocyte	Cumulative Contribution to Dissimilarity (%)
17°C / pH 8.15	16.45	White	44.78
vs.		Phagocytes	72.98
17°C / pH 7.6		Vibratile	87.8
		Red	100
17°C / pH 8.15	20.97	White	39.74
vs.		Phagocytes	69
23°C / pH 8.15		Red	86.93
		Vibratile	100
17°C / pH 8.15	20.15	White	45.2
vs.		Phagocytes	72.78
23°C / pH 7.6		Vibratile	93.05
		Red	100
17°C / pH 7.6	17.07	White	35.32
vs.		Phagocytes	64.71
23°C / pH 8.15		Vibratile	82.62
		Red	100
17°C / pH 7.6	12.75	Phagocytes	36.38
vs.		White	65.77
23°C / pH 7.6		Vibratile	87.35
		Red	100
23°C / pH 8.15	22.39	White	30.77
vs.		Phagocytes	59.46
23°C / pH 7.6		Vibratile	83.35
		Red	100

Table S4. Types of coelomocytes contributing to the dissimilarity in cell counts of coelomic fluid collected from *Heliocidaris erythrogramma* exposed to temperature and pH treatments for 15 days (n = 5 per treatment).

Treatment	Average Dissimilarity (%)	Type of Coelomocyte	Cumulative Contribution to Dissimilarity (%)
17°C / pH 8.15	13.33	Vibratile	30.73
vs.		Phagocytes	57.86
17°C / pH 7.6		White	83.06
		Red	100
17°C / pH 8.15	15.63	Vibratile	37.66
vs.		Phagocytes	60.88
23°C / pH 8.15		White	83.12
		Red	100
17°C / pH 8.15	18.91	White	29.62
vs.		Phagocytes	57.39
23°C / pH 7.6		Vibratile	82.63
		Red	100
17°C / pH 7.6	17.13	Vibratile	40.16
vs.		White	65.11
23°C / pH 8.15		Phagocytes	89.98
		Red	100
17°C / pH 7.6	19.36	White	37.96
vs.		Vibratile	67.8
23°C / pH 7.6		Phagocytes	92.12
		Red	100
23°C / pH 8.15	17.30	White	37.47
vs.		Phagocytes	73.85
23°C / pH 7.6		Vibratile	90.97
		Red	100

Table S5. Types of coelomocytes contributing to the dissimilarity in cell counts of coelomic fluid collected from *Heliocidaris erythrogramma* exposed to temperature and pH treatments for 30 days (n = 5 per treatment).

Treatment	Average Dissimilarity (%)	Type of Coelomocyte	Cumulative Contribution to Dissimilarity (%)
17°C / pH 8.15	45.78	Vibratile	46.08
vs.		White	90.71
17°C / pH 7.6		Phagocyte	95.61
		Red	100
17°C / pH 8.15	47.60	Vibratile	47.21
vs.		White	85.92
23°C / pH 8.1		Phagocyte	96.89
		Red	100
17°C / pH 8.15	48.27	Vibratile	45.59
vs.		White	85.78
23°C / pH 7.6		Phagocyte	94.69
		Red	100
17°C / pH 7.6	17.75	White	37.28
vs.		Phagocyte	68.78
23°C / pH 8.1		Vibratile	89.99
		Red	100
17°C / pH 7.6	18.08	White	42.36
vs.		Vibratile	67.67
23°C / pH 7.6		Phagocyte	89.4
		Red	100
23°C / pH 8.1	20.33	White	40.42
vs.		Phagocyte	71.69
23°C / pH 7.6		Vibratile	90.15
		Red	100

References:

Pierrot D, Lewis E, Wallace D. MS Excel program developed for CO_2 system calculations. ORNL/CDIAC-105a Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, US Department of Energy, Oak Ridge, Tennessee. 2006.